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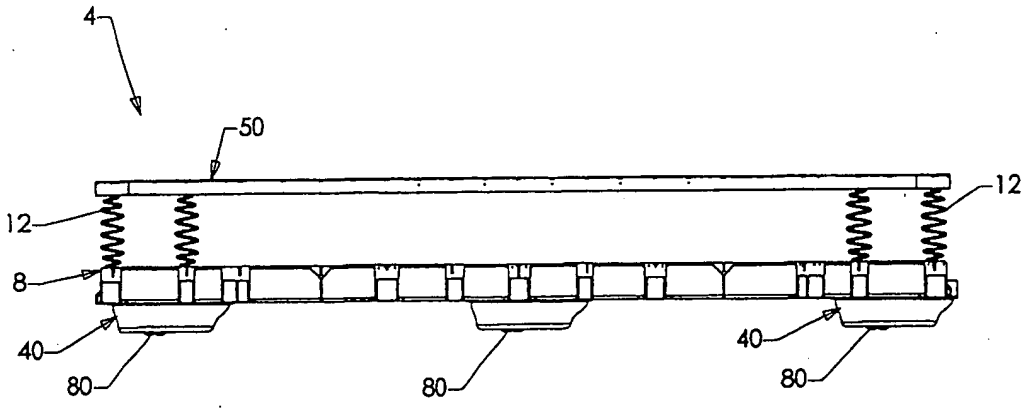

(57) Abstract

A bed base (4) including: lower support means (8); a plurality of legs (40) for supporting the lower support means; upper support means (50) for supporting a layer of padding; springs (12) acting between the lower support means and the upper support means; and a fabric cover connected to the base grid and extending over said layer, characterised in that the lower support means (8) comprises a base grid integrally moulded as a unitary structure from plastics material.

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BED BASE

This invention relates to a bed base.

Modern beds usually comprise a bed base upon which a mattress is supported. The bed base itself normally includes a number of springs. It is typically formed by constructing a wooden framework which forms the main support structure for the bed base. Legs extend downwardly from the bed base and a plurality of springs are supported on the base. A wire mesh like structure supports the tops of the springs. The mesh like structure also provides a support base for a layer of padding which extends above the mesh like structure and extends about the sides of the spring array. Finally, a fabric cover extends over the padding layer.

The manufacture of bed bases in the conventional manner is somewhat labour intensive.

It is an object of the invention to provide an alternative approach to manufacturing bed bases which results in savings in labour.

According to a first aspect of the invention there is provided a bed base including:

lower support means;

a plurality of legs for supporting the lower support means;

upper support means for supporting a layer of padding;

springs acting between the lower support means and the upper support means; and

a fabric cover connected to the base grid and extending over said layer,

characterised in that the lower support means comprises a base grid integrally moulded as a unitary structure from plastics material.

Preferably, the lower support structure is integrally moulded with said first and second support means.

Preferably further, the first support means comprise sockets and the second support means comprise sockets.

Preferably further, the support structure is moulded from polypropylene.

The bed base may include springs or resilient members, the upper ends of which support a wire mesh in the conventional manner. Preferably, the wire mesh is covered by a padding layer and fabric similar to known techniques.

In accordance with a second aspect of the invention, an upper support structure is provided to replace the wire mesh for supporting the padding.

In accordance with the second aspect of the invention there is provided a bed base comprising a lower support structure and an upper support structure, characterised in that the lower and upper support structures are each moulded from plastics materials and include means for supporting springs or resilient members therebetween.

In this arrangement, the padding can be supported by the top surface of the upper structure.

The invention will now be further described with reference to the accompanying drawings, in which:

Figure 1 is a perspective view of a bed;

Figure 2 is a schematic sectional view through an embodiment of the invention;

Figure 2A is a schematic sectional view through another embodiment of the invention;

Figure 3 is a schematic sectional view through another embodiment of the invention;

Figure 4 is a perspective view of the base grid;

Figure 5 is a perspective view of the underside of the base grid;

Figure 6 is a plan view of the base grid;

Figure 7 is an underside view of the base grid;

Figure 8 is a side view of the base grid;

Figure 9 is a longitudinal section through the base grid;

Figure 10 is an enlarged sectional view through the base grid;

Figure 11 is a perspective view of the top grid;

Figure 12 is a plan view of the top grid;

Figure 13 is an underside view of the top grid;

Figure 14 is a longitudinal section through the top grid;

Figure 15 is a more detailed fragmentary longitudinal cross-section through the top grid;

Figure 16 is a fragmentary perspective view of the top grid;

Figure 17 is a fragmentary perspective view of the underside of the top grid;

Figure 18 is a perspective view of a spring;

Figure 19 is a side view of the spring;

Figure 20 is a perspective view of a leg assembly;

Figure 21 is a perspective view of the leg assembly partly in section;

Figure 22 is a view partly in longitudinal section of the bed base;

Figure 23 is a schematic perspective view of an anti-sway system;

Figure 24 is a view of an anti-sway rod;

Figure 25 is a side view showing the anti-sway system;

Figure 26, 27 and 28 are schematic views illustrating the anti-sway system;

Figure 29 is a fragmentary cross-sectional view showing one technique for fixing of the cover to the bottom grid;

Figure 30 shows an edge strip attached to the edge of the cover; and

Figures 31, 32 and 33 are fragmentary views showing how inserts can be used to produce grids of different sizes; and

Figures 34 and 35 are fragmentary views showing details of the attachment of a wire mesh to the base grid.

Figure 1 diagrammatically illustrates a bed 2. The bed comprises a bed base 4 which supports a mattress 6. Figure 2 diagrammatically illustrates a cross-sectional view through

an embodiment of a bed base 4 constructed in accordance with the invention. It comprises a unitary base grid 8, a plurality of legs 10 and an array of compression springs 12. The tops of the compression springs 12 are connected to and supported by a wire mesh 14. The wire mesh 14 supports a layer 16 of padding and a fabric cover 18 extends about the tops and sides of the layer 16 of padding. In accordance with the invention, the base grid 8 is integrally moulded from plastics material such as polypropylene. The springs 12, mesh 14, layer of padding 16 and cover 18 can, however, be formed in more or less a conventional manner and thus need not be described in further detail.

Figure 3 diagrammatically illustrates an alternative embodiment of the invention. In this arrangement, an upper grid 50 is provided to take the place of the mesh structure 14. The upper grid 50 provides a secure mounting for the upper ends of the springs 12 and provides a support base for the layer 16 of padding.

The upper grid 50 could comprise a structure which is identical to the base grid 8 but it has been found that the upper grid 50 need not be as robust as the base grid 8. Accordingly, in the preferred embodiment of the invention the upper grid 50 is a different moulding having a preferred structure as illustrated in Figures 11 to 14.

The wire mesh 14 could be of a conventional type or a Powerfirm mesh 15 developed by Leggett & Platt. As this mesh is well known, details need not be included. In the Powerfirm mesh 15, the compression springs 12 are not required.

The base grid 8 is described in more detail in Figures 4 to 10. The grid is injection moulded from plastics material such as polypropylene co-polymer. The base grid 8 can be moulded in various sizes appropriate for a queen size mattress, double mattress, or various sizes of single bed mattresses. A difficulty with moulding a grid of this size, particularly for the queen size, is to make a moulding of sufficient strength while not requiring excessive amounts of material. If too much material were required, then the cost of materials would be prohibitive and the resultant bed base would be excessively heavy. It has been found that by

adopting a particular configuration shown in Figures 4 to 10, having the general configuration of a criss-cross pattern of inverted U-section beams, a grid having sufficient strength can be moulded without using excessive amounts of material. In the illustrated arrangement, the wall thickness of the beams which make up the criss-cross structure are about 2.5mm in thickness. This enables a base grid 8 suitable for a queen size bed to have a weight of only about 11.4kg.

It will be seen from Figures 4 to 10 that the base grid 8 has a plurality of longitudinally extending beams 20 and a plurality of transversely extending beams 22. As best seen in Figure 11, each of the beams 20 and 22 is of inverted U-shaped profile. The lower periphery of the base grid 8 is formed with a downwardly extending skirt 24 which forms an open peripheral slot 26 which can be used for fixing the fabric cover 18, as will be described below. Each of the beams 20 includes downwardly extending sidewalls 28 connected by webs 30. The web portions of the beams define the top plane of the grid. Similarly, the transverse beams 22 are formed by downwardly extending sidewalls 32 connected together by a web 34, the web 34 again being in the top plane of the grid. Each of the lower edges of the sidewalls 28 and 32 is formed with outwardly projecting flanges 29 and 31 (some of which have been omitted in Figures 9 and 10 for clarity of illustration). The centres of the beams 52 and 54 which make up the top grid 50 are centred at about 240mm spacings.

As best seen in Figure 10, the webs 30 and 34 are provided with a plurality of spring sockets 36 for receiving ends of the compression springs 12, as will be described in more detail below. The webs 30 and 34 also can be formed with elongate slots 38 which are appropriate for receipt of parts of a Powerfirm mesh 14 of the type developed by Leggett & Platt referred to above.

The underside of the base grid 8 is preferably formed with a plurality of sockets 44 for receipt of upper parts of the legs 10. In the preferred arrangement, however, the legs comprise a leg assembly 40 of the type illustrated in more detail in Figures 18 to 22. Each of the leg assemblies 40 includes three hollow mounting spigots 42 arranged in a generally

triangular configuration. Accordingly, the underside of the base grid 8 is formed with sockets 44 arranged in groups of three so as to receive the spigots 42 of the leg assembly. As best seen in Figure 7, groups of sockets 44 are provided in each of the corners of the base grid 8, and at the mid points of the sides and top and bottom of the grid. A group of four sockets 44 is provided at the centre of the grid such that one of the leg assemblies 40 can be fitted in either direction towards the head or foot of the bed (that is, the orientation of the longest sidewall of the leg assembly 40).

Figures 11 to 17 illustrate in more detail the preferred structure for the upper grid 50. The grid 50 is again injection moulded from plastics material such as polypropylene. The material can be of the same type as that used for forming the base grid 8 but other alternatives would include nylon. It has been found that an upper grid 50 having sufficient rigidity can be moulded from polypropylene and having a weight as low as 6kg, for a queen size bed.

In this arrangement, the upper grid 50 includes a plurality of longitudinally extending beams 52 and a plurality of transversely extending beams 54. The beams 52 and 54 are in this instance solid and T-shaped in cross-section and having a typical wall thickness of about 2.0mm to 3.5mm and preferably 2.5mm. The grid 50 is provided with a peripheral flange 56 which is in the form of a beam having an inverted L-shape section, as shown in Figure 15. Typically the beams 52 and 54 are centred about 60mm apart and the depth of the beams 52 and 54 is typically 23mm but each alternate beam 51 and 53 could be about half this depth to reduce materials usage, as shown in Figures 15, 16 and 17.

The upper grid 50 is also formed with a plurality of spring sockets 58 which receive the upper ends of the springs 12. Preferably the sockets 58 are formed at selected points of intersection of the beams 52 and 54, as shown in Figure 17.

Figures 18 and 19 diagrammatically illustrate the preferred form of the compression springs 12. These are preferably in the form of an open helix which is of wider diameter near the middle thereof. The springs 12 are each formed with upper and lower mounting

projections 60 and 62. The projections 60 and 62 include barbs 64. The springs are symmetrical so that they can be fitted with either end up or down. The projections 60 and 62 are inserted in the sockets 58 and 36 respectively of the grids 50 and 8. The diameters of the projections 60 and 62 are such that they fit snugly within their respective sockets and the barbs 64 tend to prevent withdrawal of the mounting spigots once they have been inserted in the sockets. Figure 22 diagrammatically illustrates the springs 12 mounted between the upper and lower grids 50 and 8.

Figures 20 and 21 diagrammatically illustrate the preferred form of leg assembly 40 constructed in accordance with the invention. The leg assembly 40 is arranged such that the effective height thereof is normally in the range from 50mm to 150mm. The leg assembly 40 includes a hollow body 70 having three generally triangularly disposed sidewalls 72, 74 and 76. The sidewall 74 is longer than the sidewalls 72 and 76 so that some flexibility is possible in the orientation of the leg assembly 40 relative to the base grid 8. The height of the sidewalls is selected so as to be either say 50mm, 100mm or 150mm, depending on requirements. The body 70 includes a base 77 which is formed with a domed chamber 78 within which may be mounted a castor 80. As will be described below in the preferred embodiments of the invention, some of the leg assemblies do not include the castor 80.

As best seen in Figure 21, the castor 80 includes a mounting shaft 90 which extends through a cylindrical body 92 formed in the chamber 78. A compression spring 91 surrounds the shaft 90 and acts between a shoulder 94 formed in the body portion 92 and a shoulder 96 formed on the shaft 90, as shown in Figure 21. A circlip 98 is mounted on the shaft 90 so as to prevent removal of the shaft 90 in a downward direction.

The arrangement is such that when the bed base is unloaded, that is to say when a person is not lying upon a mattress 6, the castor 80 engages the floor so that the bed can be moved about readily by a user. When, however, the bed is subjected to a load, the springs 91 retract and the base 77 engages the floor so as to provide a relatively wide support area for the load. This has the advantage that it prevents excessive loads being borne by the castors

80 and also prevents damage to the surface of the floor.

It is envisaged that the castor 80 would be provided in the leg assemblies located at the corners of the bed base, in other words for queen, double and various size single beds, there would be four of the leg assemblies which include castors 80. For queen and double bed sizes, there would be five other assemblies which do not include castors. For various single size beds there would be two other assemblies which do not include castors.

The springs 91 preferably have a spring constant of about 1.8kg/per millimetre. This together with the number and arrangement of assemblies having castors is sufficient to provide the feature of support by the castors 80 when the bed is unloaded and support by the base 77 when the bed is loaded.

It is preferred that the bed base of the invention incorporates means for preventing excessive lateral or longitudinal displacement of the top grid 50 relative to the base grid 8. In the preferred embodiment of the invention, the bed base includes anti-sway rods 110. These preferably comprise a spring steel rod, say 5mm in diameter and having a length of about 600mm. The structure and mounting of the rods 110 is diagrammatically illustrated in Figures 23 to 28.

Figure 23 shows schematically four anti-sway rods 110 connected between the upper grid 50 and the base grid 8. It will be seen that the rods 110 at the head and foot of the bed base extend in opposite directions. Similarly, rods 110 are connected between the grids near the midpoints of the sides. Again, the rods 110 extend in opposite directions along the sides of the bed. The arrangement has general symmetry about a perpendicular axis 111 through the centre of the bed. Each of the rods may comprise a spring steel rod of about 5mm diameter having a length of about 600mm. As best seen in Figure 28, the rod 110 is formed with transverse mounting portions 112 at either end thereof. The mounting portions 112 are received within recesses 116 and 118 integrally formed with the upper grid 50 and base grid 8, respectively. The anti-sway rods 110 prevent excessive translations of the upper grid 50

relative to the base grid 8 without inhibiting substantially relative displacements in the vertical direction between the grids, i.e. the displacements accommodated by compression of the springs 12.

Figures 29 and 30 diagrammatically illustrate the preferred technique for mounting of the fabric cover 18 relative to the lower grid 8. In this technique, the lower edge of the fabric cover 18 is fixed to an edging strip 120 by means of a row of stitching 122, which passes through the fabric and the strip. The strip may comprise a polypropylene strip which runs along substantially the full length of the outer peripheral longitudinal beams 20 and transverse beams 22. The strip 120 is preferably extruded from plastics material such as polypropylene and has a width of say 12mm and a thickness of 1.5mm. As seen in Figure 30, the fabric cover 18 is folded about three sides of the strip 120 prior to insertion into the peripheral slot 26. The dimensions of the slot relative to the strip 120 are such that there is a snug fit. The arrangement is such that when the fabric 18 is subjected to forces which would tend to pull the fabric away from the base grid 8, the interlocking of the strip with the slot resists displacement of the lower edge of the cover from the slot.

The base grid 8 and top grid 50 can be moulded in different sizes appropriate for different size beds such as queen, double, single and so on. Preferably the die for each of the components is provided with a number of inserts which can be fitted to the queen size arrangement in order to mould the grids of smaller dimensions. Inserts of this general type are known in the field of injection moulding and therefore need not be described in detail. In the arrangement of the invention, appropriate inserts are provided to form the edge formations appropriate for the smaller dimension grids. In this way the basic arrangement of the central part of the die is utilised for all of the grids regardless of size.

Figures 31 and 32 schematically illustrate the effect of the use of an appropriate insert to produce a double bed base grid 130, the queen size periphery of the base grid 180 for a queen size bed being shown in broken lines. Thus, the central part of the die is used to form the central part of all grids regardless of size. This results in substantial saving in tooling

costs.

The dimensions and estimated weights for different size bed bases is set out in Table 1 below.

TABLE 1

Description	Finished Base Width mm	Finished Base Length mm	Base and Top Grids Proposed Sizes Width mm	Base and Top Grids Proposed Sizes Length mm	Est. Design Weight Base Grid kg	Est. Design Weight Top Grid kg
Queen	1530	2040	1525	2032.5	11.33	5.73
Double	1380	1880	1372.5	1880	10.48	5.30
Long Double	1380	2040	1372.5	2032.5	10.9	5.51
Single	920	1880	915	1880	7.13	3.61
Long Single	920	2040	915	1880	7.53	3.81
Long Wide Single	1070	2040	1067.5	2032.5	7.94	4.02

In all of the embodiments above, the top grid 50 would be of the same nominal outer dimensions as the base grid, except of course in those embodiments where the top grid is not used.

The same techniques can be used for producing top grids of different dimensions appropriate for different size beds. Figure 33 diagrammatically shows the superposition of top grids which would be produced from the queen size die fitted with appropriate inserts for forming smaller grids. More particularly, inserts can be used for forming a double bed size top grid 140, a long wide single top grid 142 and a single bed size top grid 144.

Figures 34 and 35 diagrammatically illustrate the manner in which the Powerfirm wire mesh 15 interlocks with the base grid 8. It will be seen that the mesh 14 includes a loop 150 which interlocks with the elongate slots 38 formed in the webs 34 of the transverse beams 22. The slots 38 are formed with lateral projections 152 which snap fit over the loops 150 as

shown in Figure 35.

In the preferred arrangement of the invention, the beams 20 and 22 of the base structure are spaced at about 200mm centres. The widths of the web portions 30 and 34 are about 35mm and the wall portions are tapered, as seen in Figures 11 and 33. The depth of the wall portions 32 and 28 are about 60mm. As mentioned above, the average wall thickness is about 2.5mm.

In order for a satisfactory bed base to be made, it is important that the grids 8 and 50 be not susceptible to excessive flexure when supporting a load. Computer simulations have been carried out on the grids and bed base constructed as described above. In one simulation, the top grid 50 in a completed bed base utilising the compression springs 12 was subjected to a loading of 120kg applied through a 300mm diameter rigid pad. It was computed that the deflection of the top grid would be less than 100mm which is deemed to be satisfactory. Similarly, a computer simulation has been used to test the deflection of the bottom grid 8. In this case the bottom grid 8 was directly loaded with a 120kg weight applied through a 300mm diameter rigid pad and the deflection was computed to be less than 8mm. This level of deflection is regarded as satisfactory.

Many modifications will be apparent to those skilled in the art without departing from the spirit and scope of the invention.

CLAIMS:

1. A bed base (4) including:
lower support means (8);
a plurality of legs (10,40) for supporting the lower support means;
upper support means (14,50) for supporting a layer (16) of padding;
springs (12) acting between the lower support means and the upper support means; and
a fabric cover (18) connected to the base grid and extending over said layer,
characterised in that the lower support means (8) comprises a base grid integrally moulded as a unitary structure from plastics material.

2. A bed base as claimed in claim 1 wherein the grid is formed from a plurality of longitudinally and transversely extending beams (20,22).

3. A bed base as claimed in claim 2 wherein the grid is formed with a peripheral skirt (24).

4. A bed base as claimed in claim 2 or 3 wherein said beams are hollow.

5. A bed base as claimed in claim 4 wherein said beams have an inverted U-shaped profile.

6. A bed base as claimed in claim 5 wherein said longitudinally extending beams are formed by first sidewalls (28) joined by a web (30) and the transversely extending beams are formed by second sidewalls (32) joined by a web (34).

7. A bed base as claimed in claim 6 wherein lower edges of said first and second sidewalls are formed with outwardly projecting flanges (29,31) respectively.

8. A bed base as claimed in any one of claims 1 to 7 wherein the base grid has leg

support means (44) formed on a lower side thereof for supporting said legs.

9. A bed base as claimed in any one of claims 1 to 8 including spring support means (36) for supporting lower ends of said springs.

10. A bed base as claimed in claim 7 wherein including leg support sockets (44) moulded between adjacent pairs of first sidewalls and/or between adjacent pairs of second sidewalls.

11. A bed base as claimed in claim 10 wherein at least some of the legs comprise leg assemblies (40) and wherein each leg assembly includes a housing (70) within which is mounted a castor (80) and on which are formed one or more mounting spigots (42) which are received in said leg support sockets (44).

12. A bed base as claimed in claim 10 wherein each housing is formed with three of said spigots (42) and wherein said leg support sockets are moulded in groups which can receive all the spigots of a housing.

13. A bed base as claimed in claim 12 wherein there are three of said sockets in groups adjacent to the periphery of the grid and four of said sockets in a group near the centre of the grid.

14. A bed base as claimed in claim 6 or 7 or any one of claims 10 to 13 including spring support sockets (36) formed in said webs (30,34), said spring support sockets receiving lower mounting portions (62) of said springs.

15. A bed base as claimed in claim 14 including elongate sockets (38) for receiving parts of a mesh (14) which forms part of or supports said upper support means.

16. A bed base as claimed in claim 3 wherein the skirt (24) defines with the adjacent sidewalls (28,32) a peripheral slot (26).

17. A bed base as claimed in claim 16 wherein edges of the cover are connected to coupling means (120) which are snugly received in said peripheral slots (26).

18. A bed base as claimed in claim 17 wherein the coupling means comprise edge strips (120) formed from plastics materials.

19. A bed base as claimed in claim 18 wherein the coupling means is connected to the cover by stitching (122).

20. A bed base as claimed in any preceding claim characterised in that the upper support means comprises an upper grid (50) integrally moulded as a unitary structure from plastics material.

21. A bed base as claimed in claim 20 wherein the upper grid (50) is formed from a plurality of longitudinally and transversely extending beams (52,54).

22. A bed base as claimed in claim 21 wherein the upper grid has an underside which is formed with upper spring support sockets (58) which receive upper mounting portions (60) of said springs.

23. A bed base as claimed in claim 21 or 22 wherein the longitudinally and transversely extending beams (51,52,53,54) of the upper grid (50) have a T-shaped profile.

24. A bed base as claimed in claim 22 wherein the upper spring support sockets (58) are formed at the junctions of the longitudinally and transversely extending beams (52,54) of said upper grid.

25. A bed base as claimed in claim 23 wherein the wall thickness of the beams of the upper grid is about 2.5mm.

26. A bed base as claimed in claim 25 wherein the bed base is queen size and the weight of the upper grid is less than about 6kg.

27. A bed base as claimed in claim 5 wherein the wall thickness of the beams of the base grid (8) is about 2.5mm.

28. A bed base as claimed in claim 27 wherein the bed base is queen size and the weight of the base grid is less than about 12kg.

29. A bed base as claimed in claim 11, 12 or 13 wherein each castor is mounted in the housing for resilient movement against the action of a compression spring (91).

30. A bed base as claimed in claim 29 wherein there is a leg assembly including a castor at each corner of the bed base.

31. A bed base as claimed in claim 30 wherein the housing (70) includes a base (77) and wherein the spring constants of said compression springs (91) are such that when a user of the bed base is supported thereon, the base engages the floor on which the bed base is supported and when the bed base supports only a mattress (6) the bed base is supported by said castors (80).

32. A bed base (4) including:

lower support means (8);

a plurality of legs (10,40) for supporting the lower support means;

a support mesh (15) for supporting a layer (16) of padding;

springs (12) acting between the lower support means and the upper support means; and

a fabric cover (18) connected to the base grid and extending over said layer,

characterised in that the lower support means (8) comprises a base grid integrally moulded as a unitary structure from plastics material.

33. A bed base as claimed in claim 32 wherein said mesh (15) comprises a *Powerfirm* mesh.

34. A method of making bed bases (4) defined in any one of claims 1 to 28 including the steps of providing a die to injection mould a base grid (8) in a queen size and inserting one or more inserts in the die in order to make base grids suitable for smaller bed sizes.

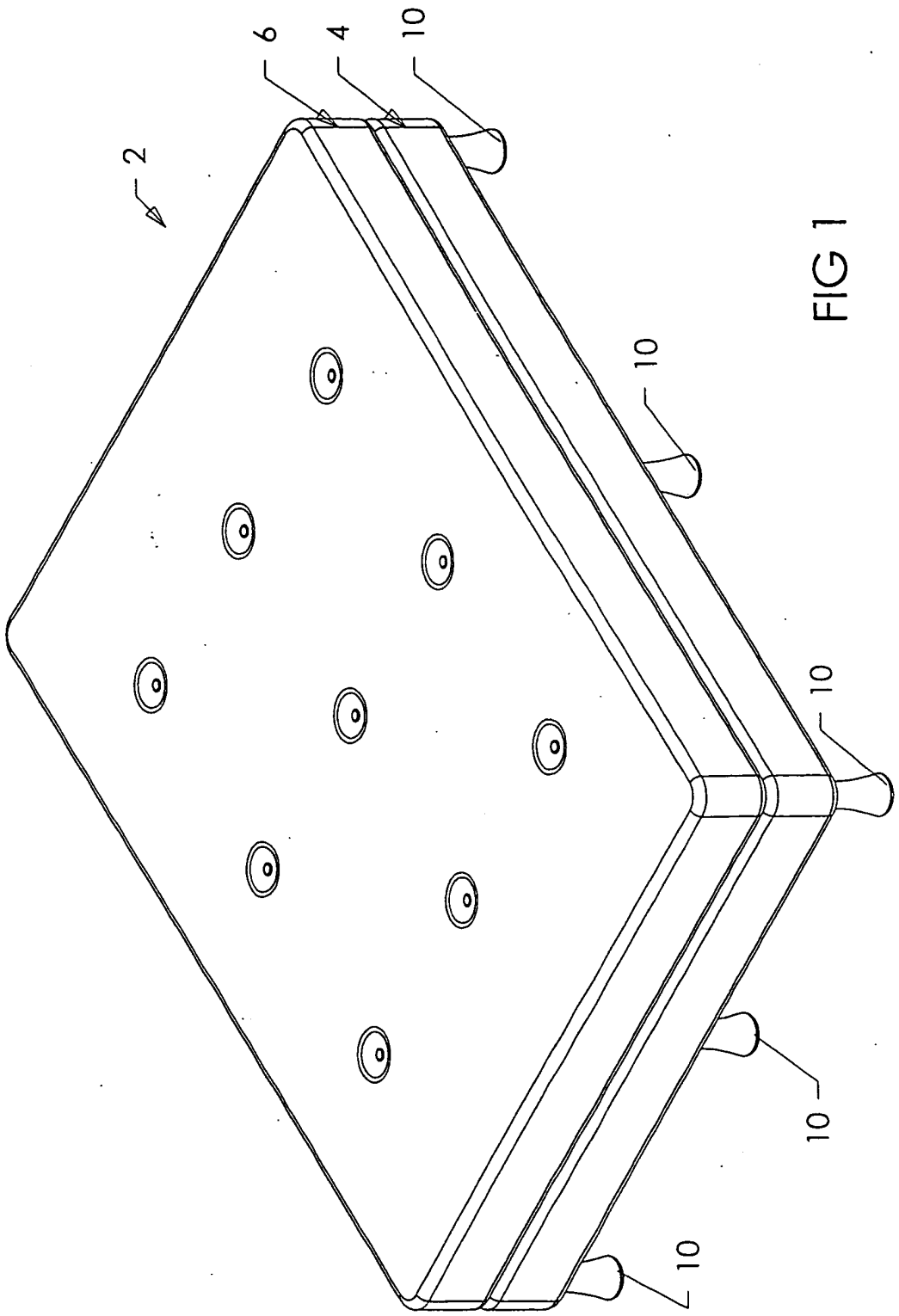


FIG 1

FIG 2

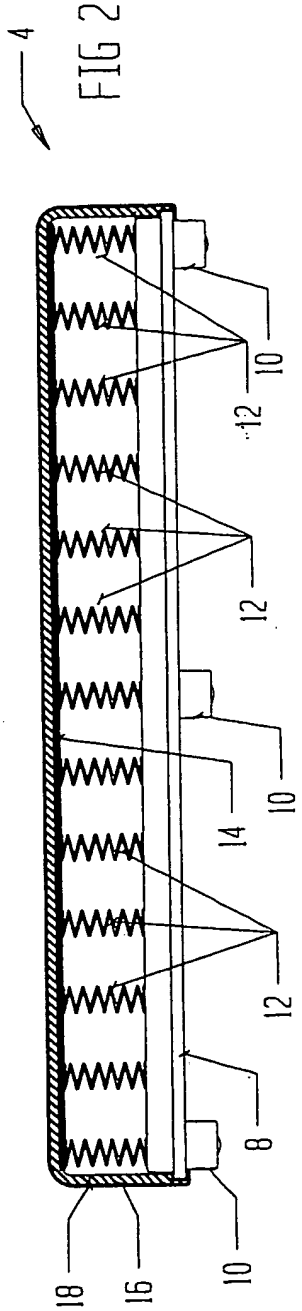


FIG 3

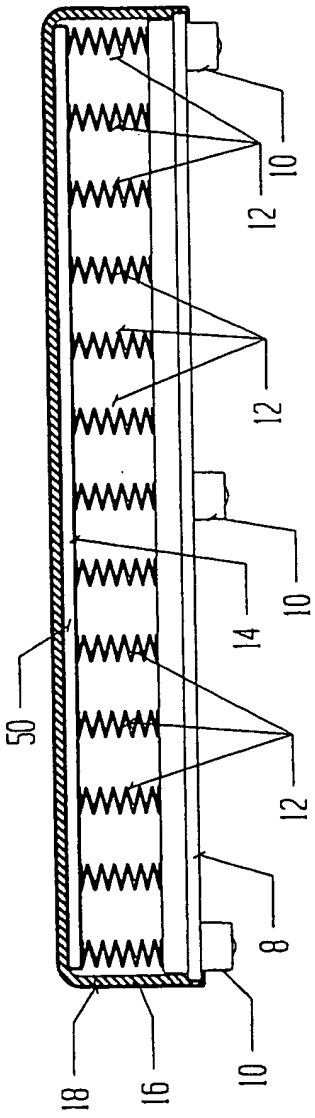
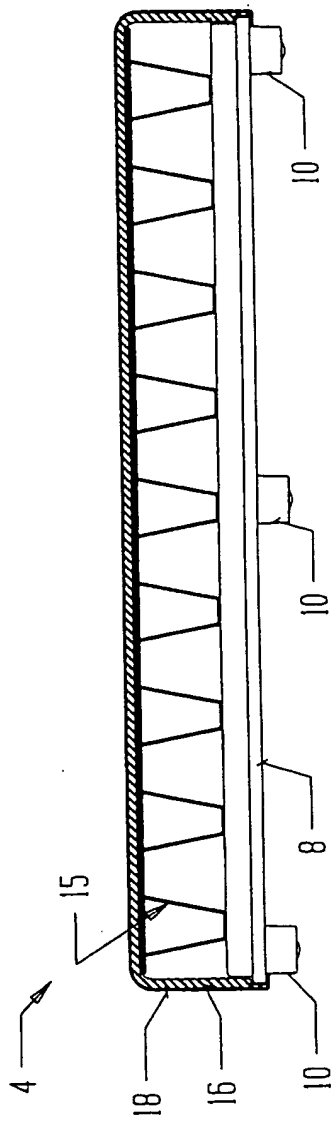


FIG 2A



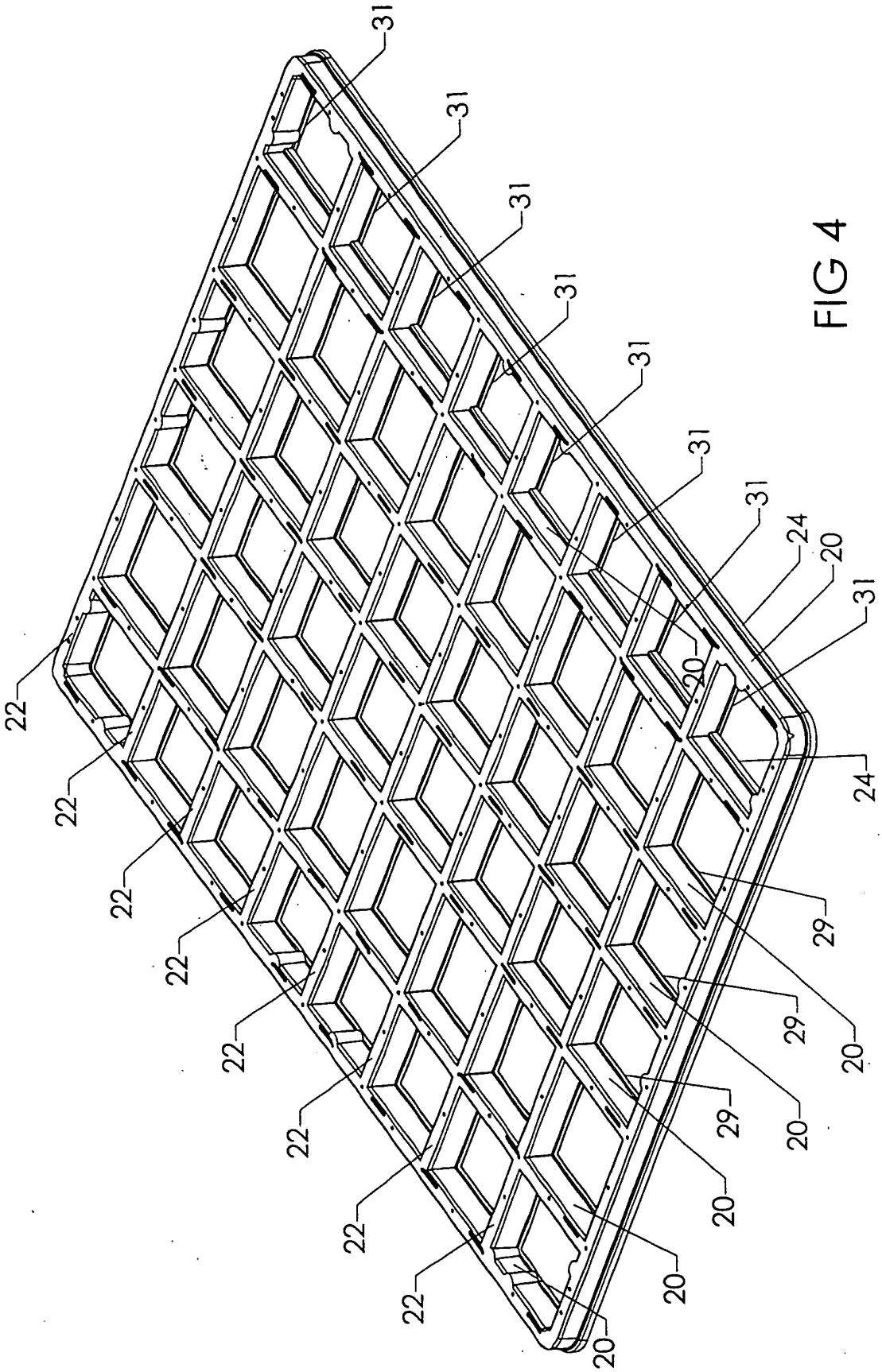

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FIG 4

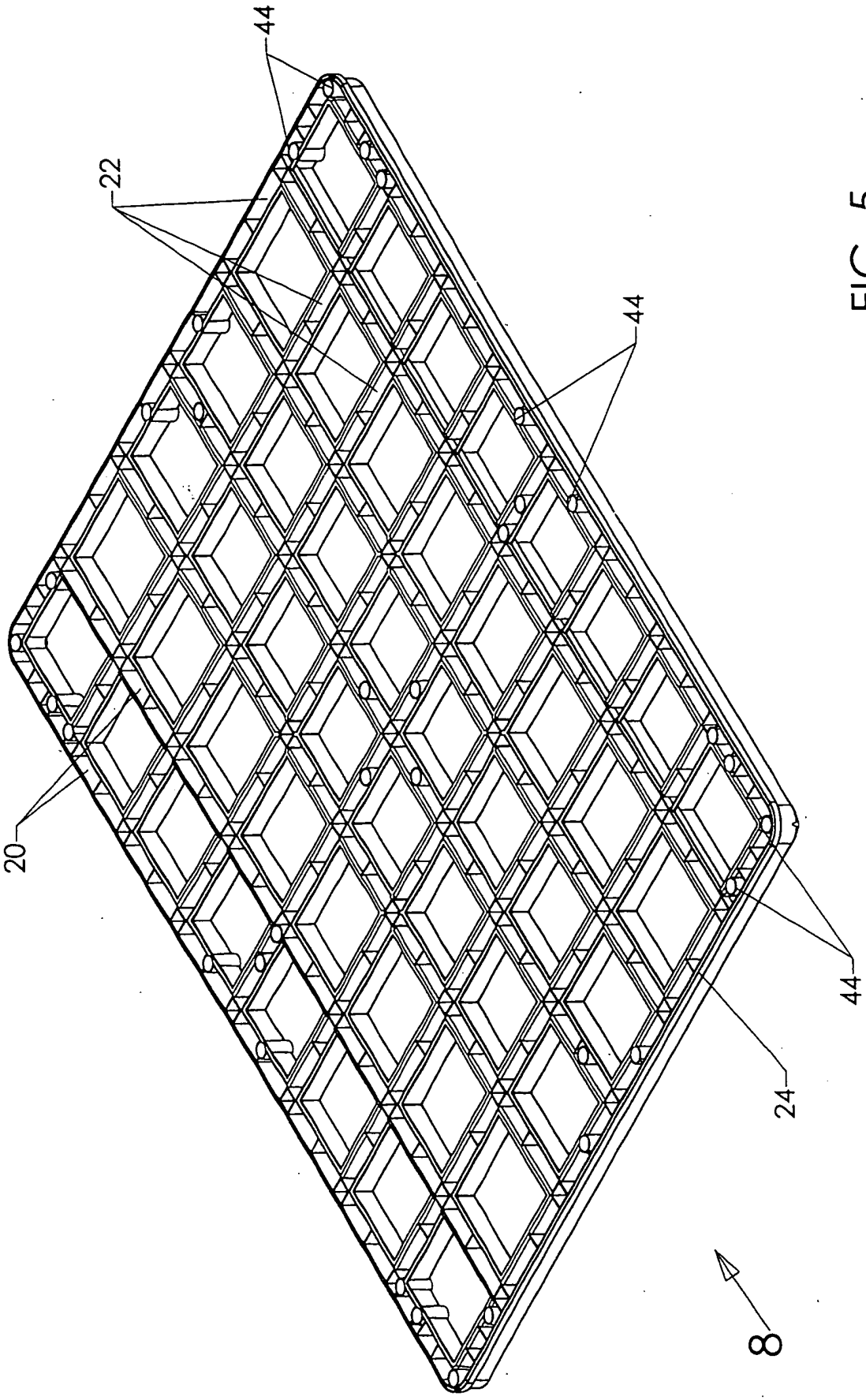


FIG. 5

FIG 6

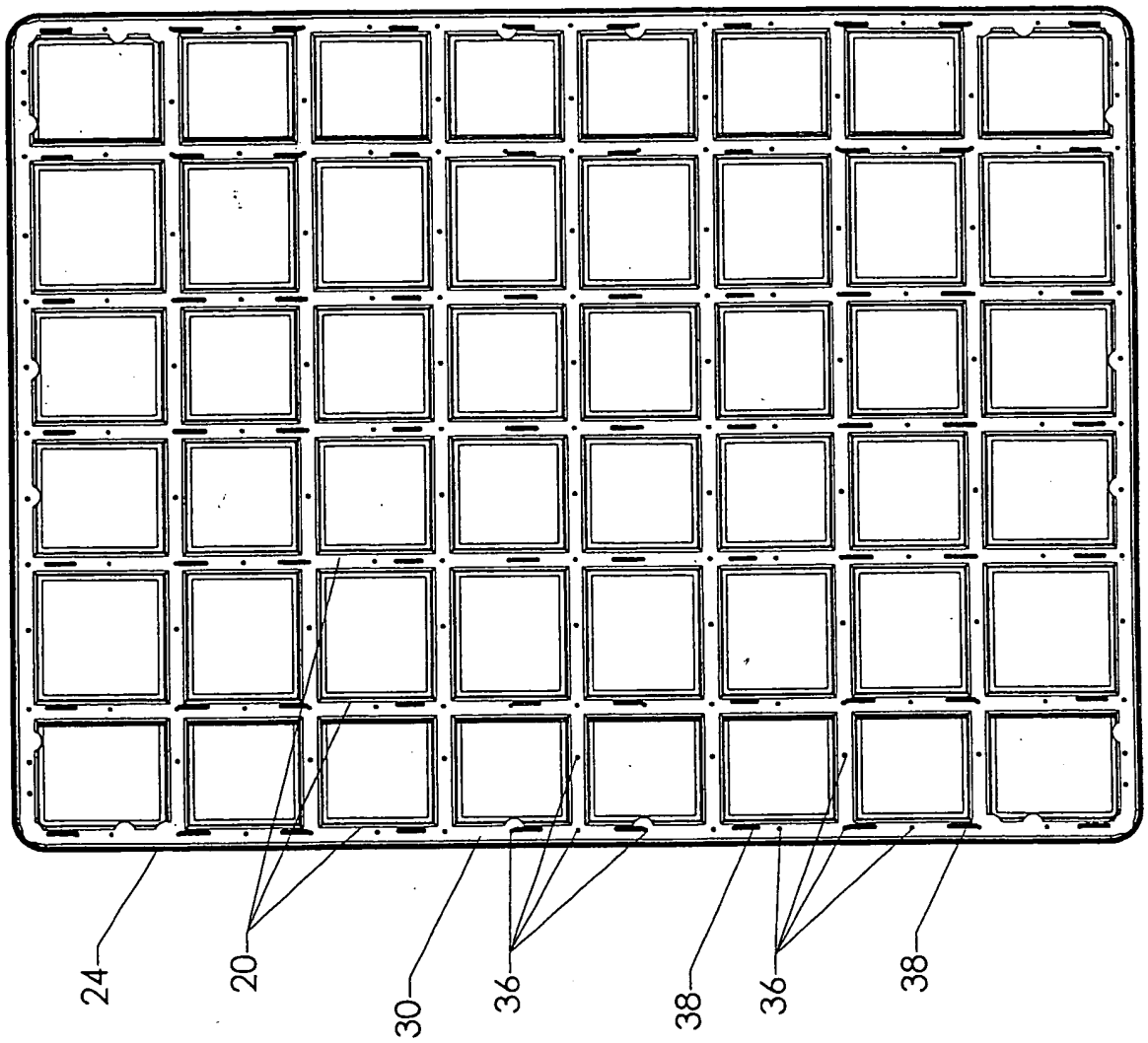


FIG 7

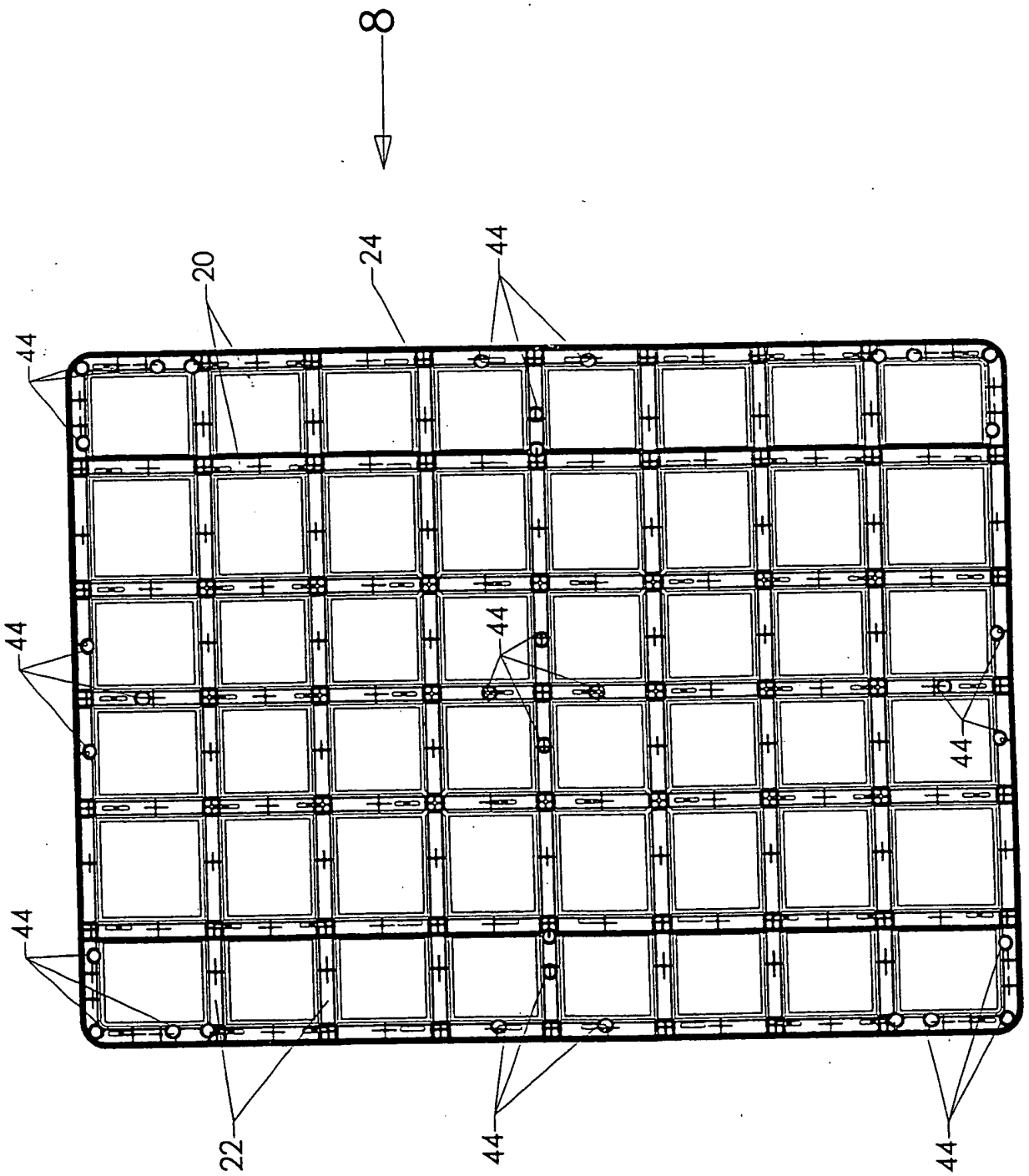
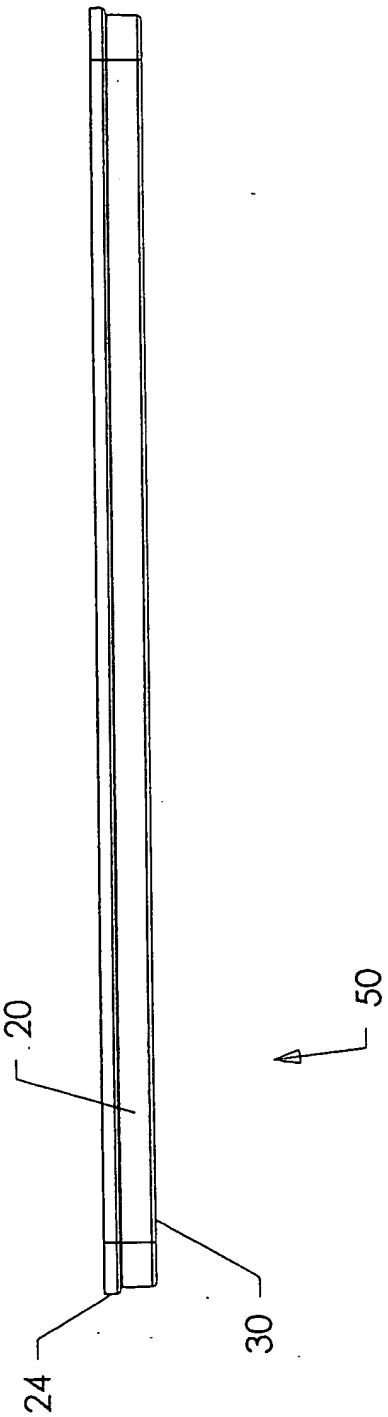


FIG 8



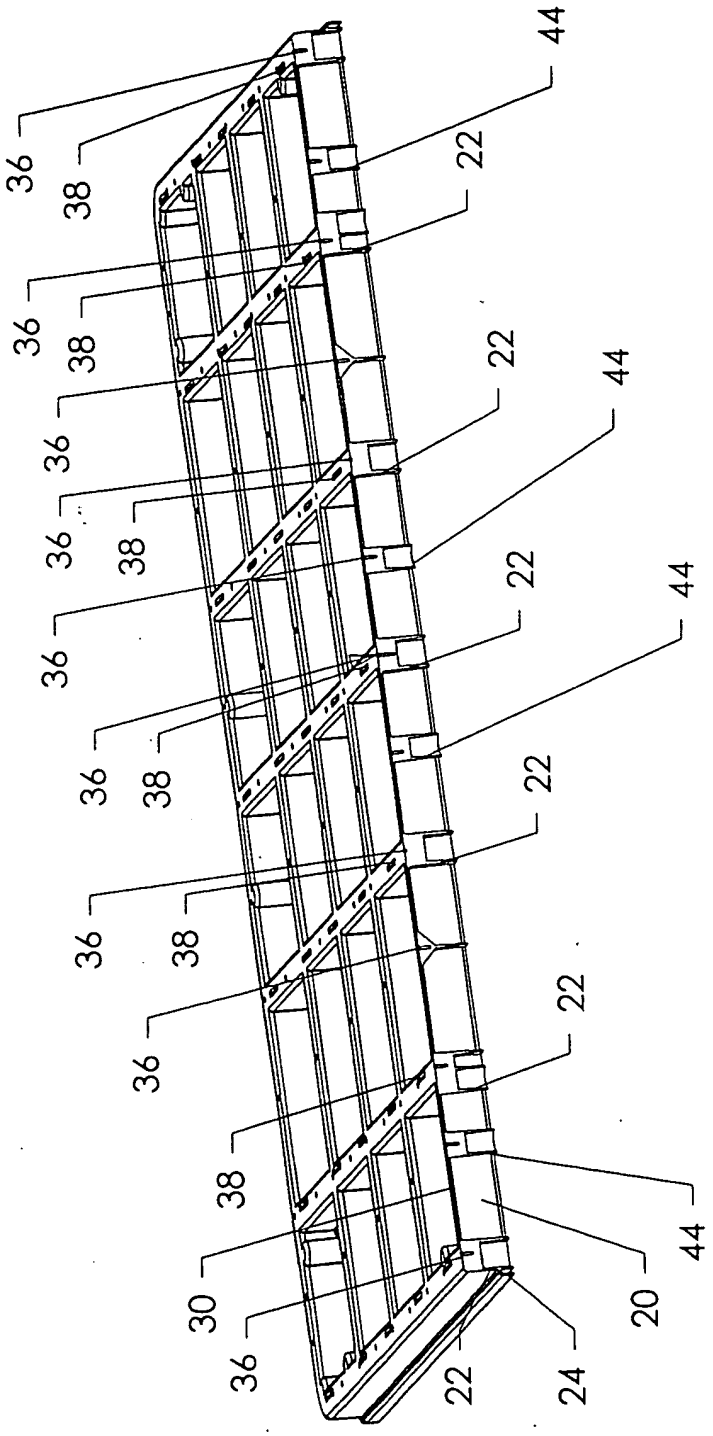


FIG 9

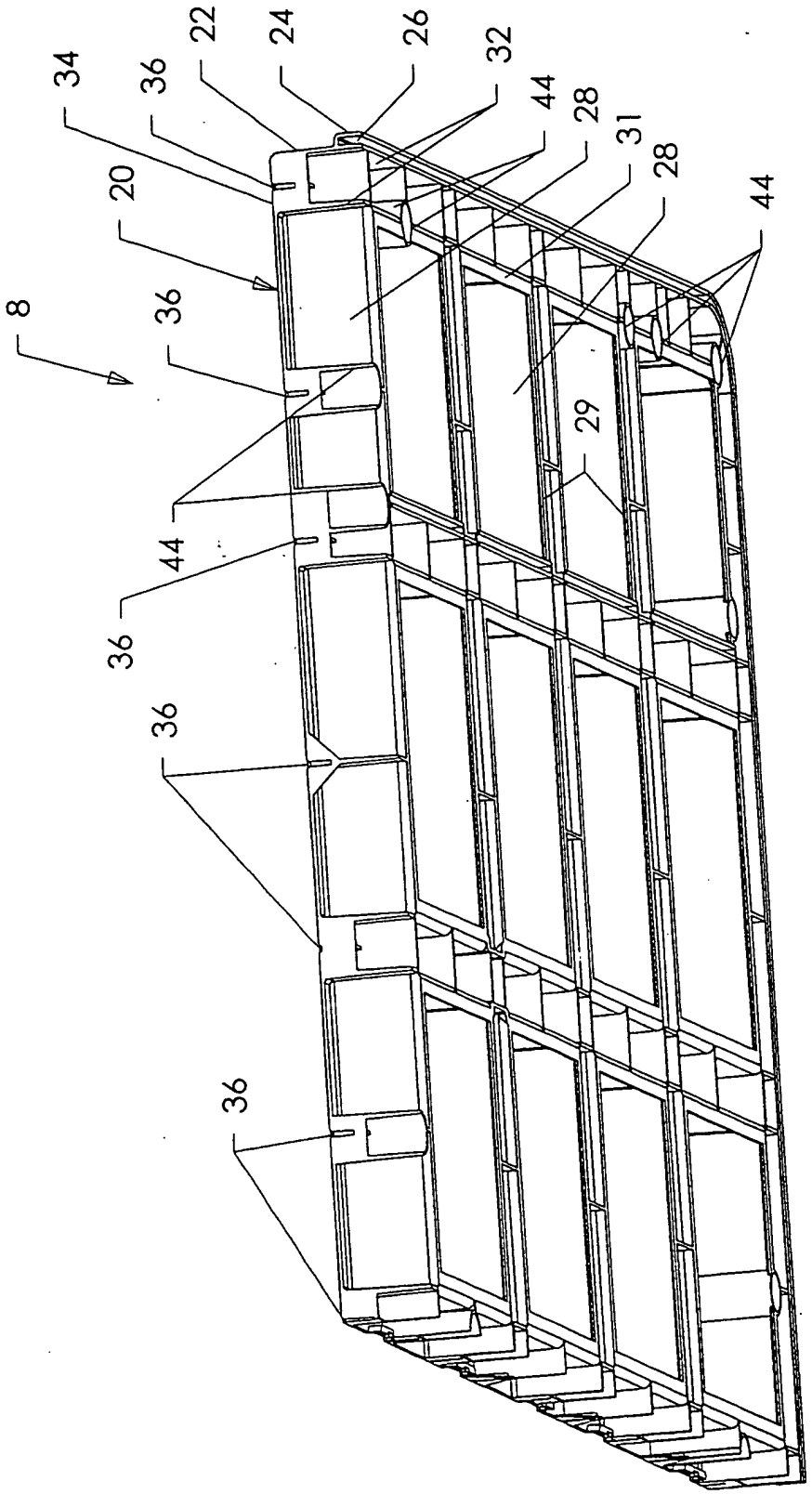


FIG 10

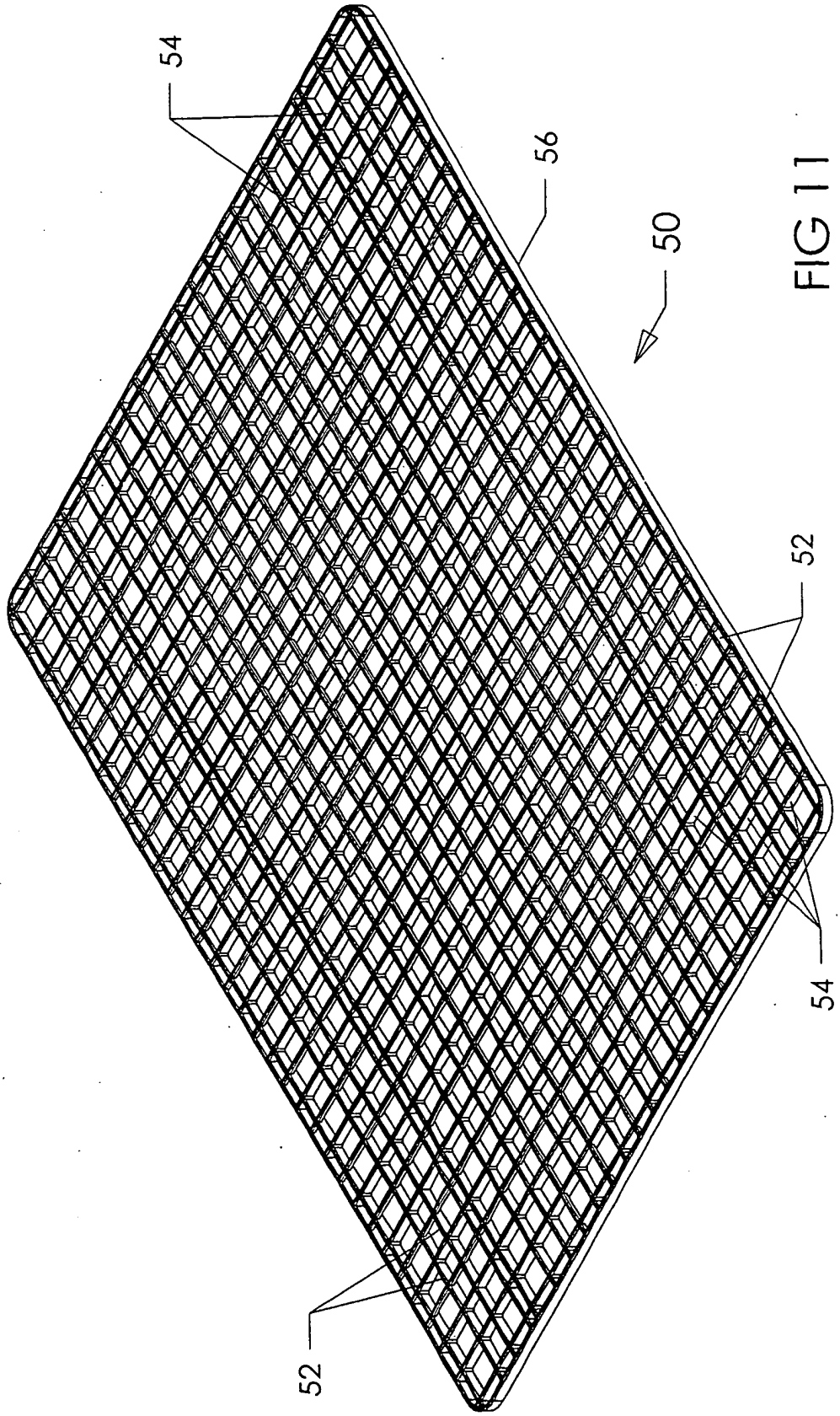


FIG 11

FIG 12

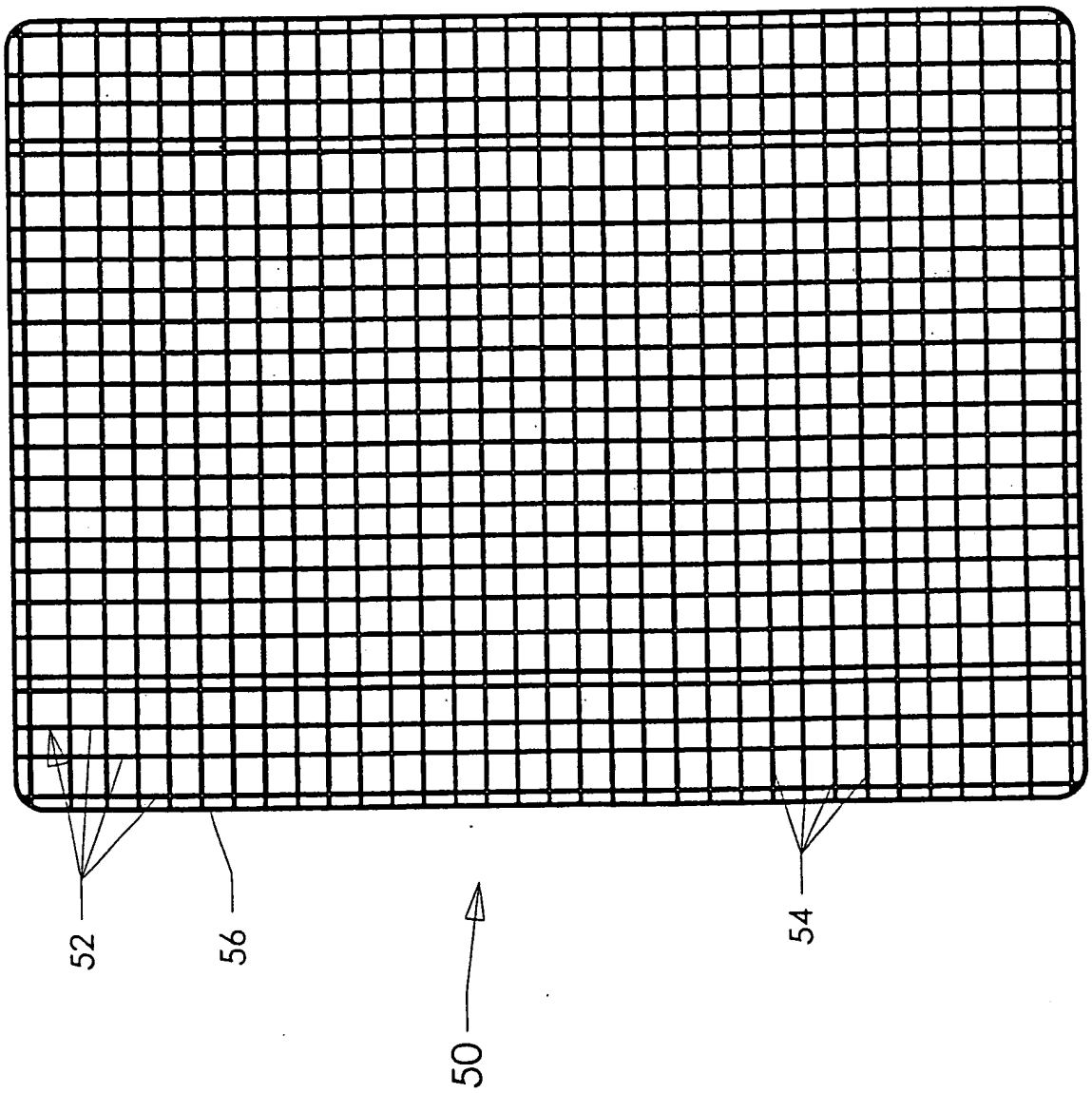
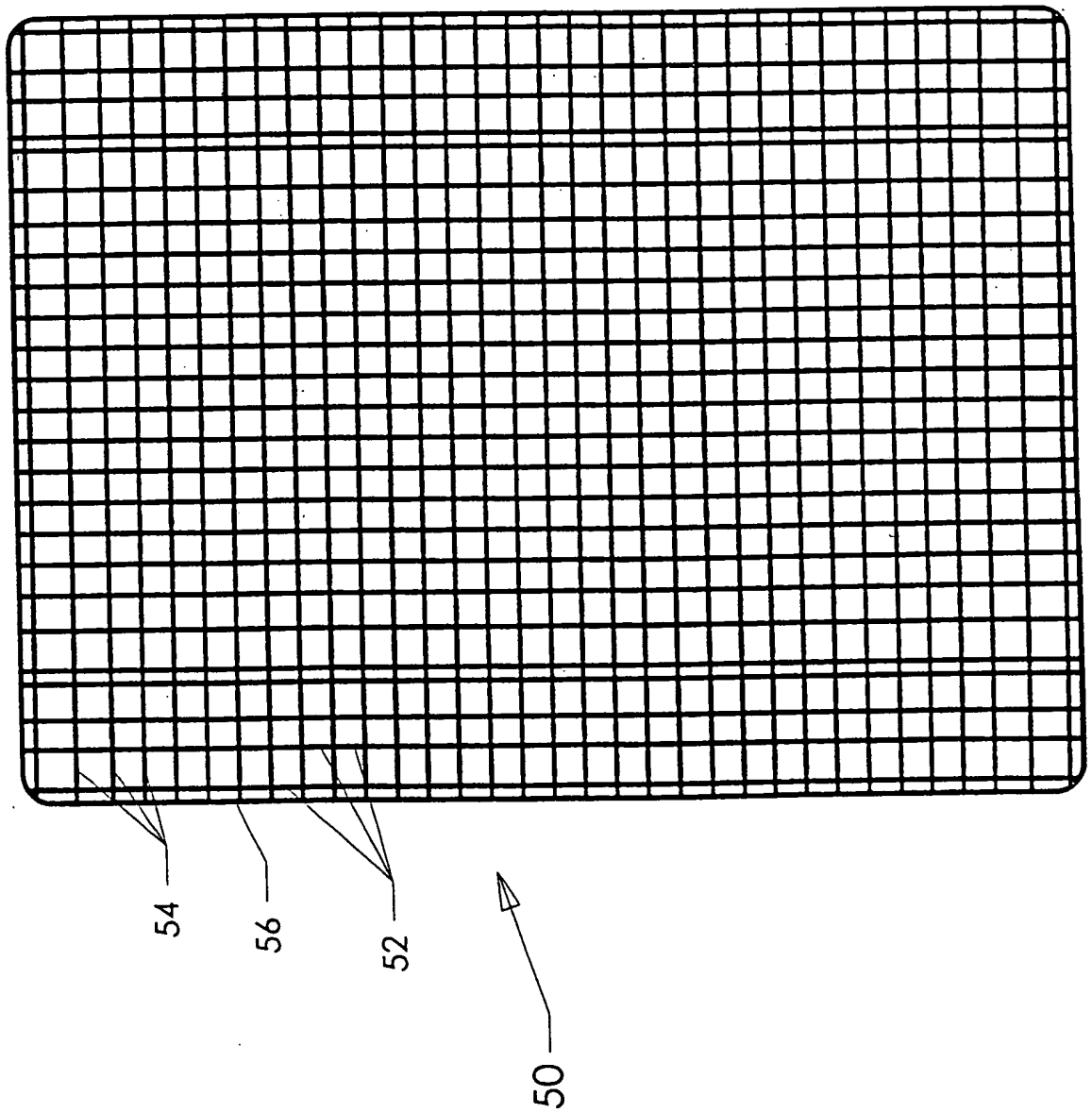


FIG 13



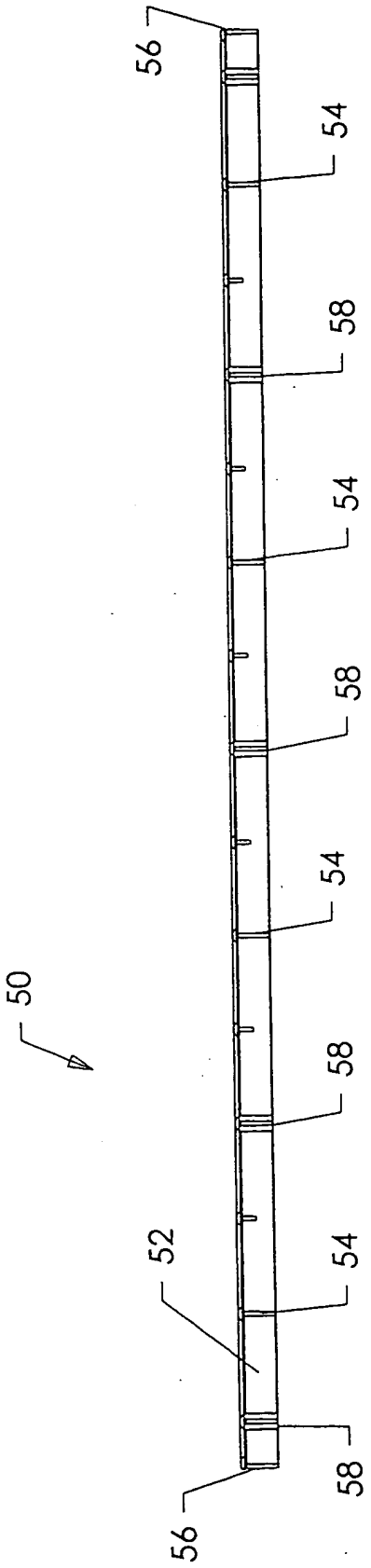


FIG 14

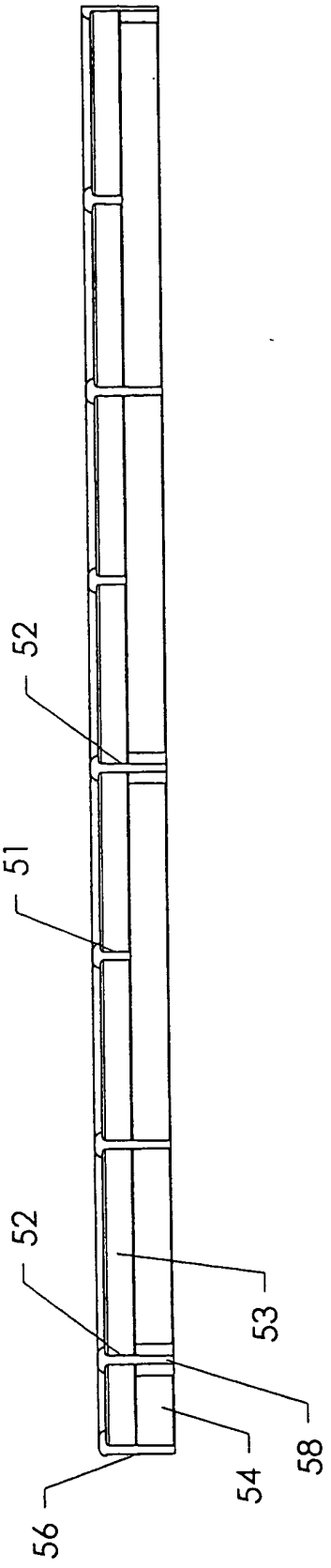


FIG 15

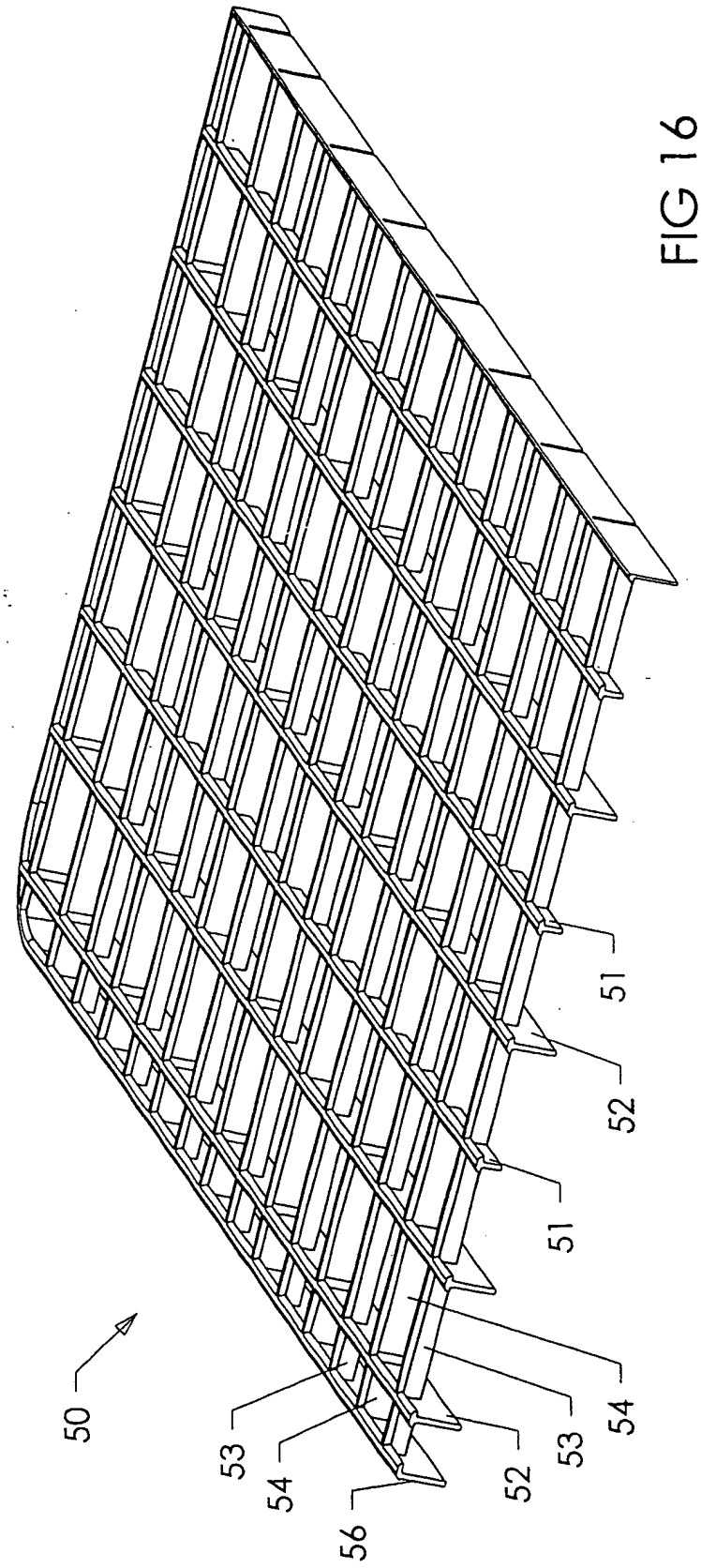


FIG 16

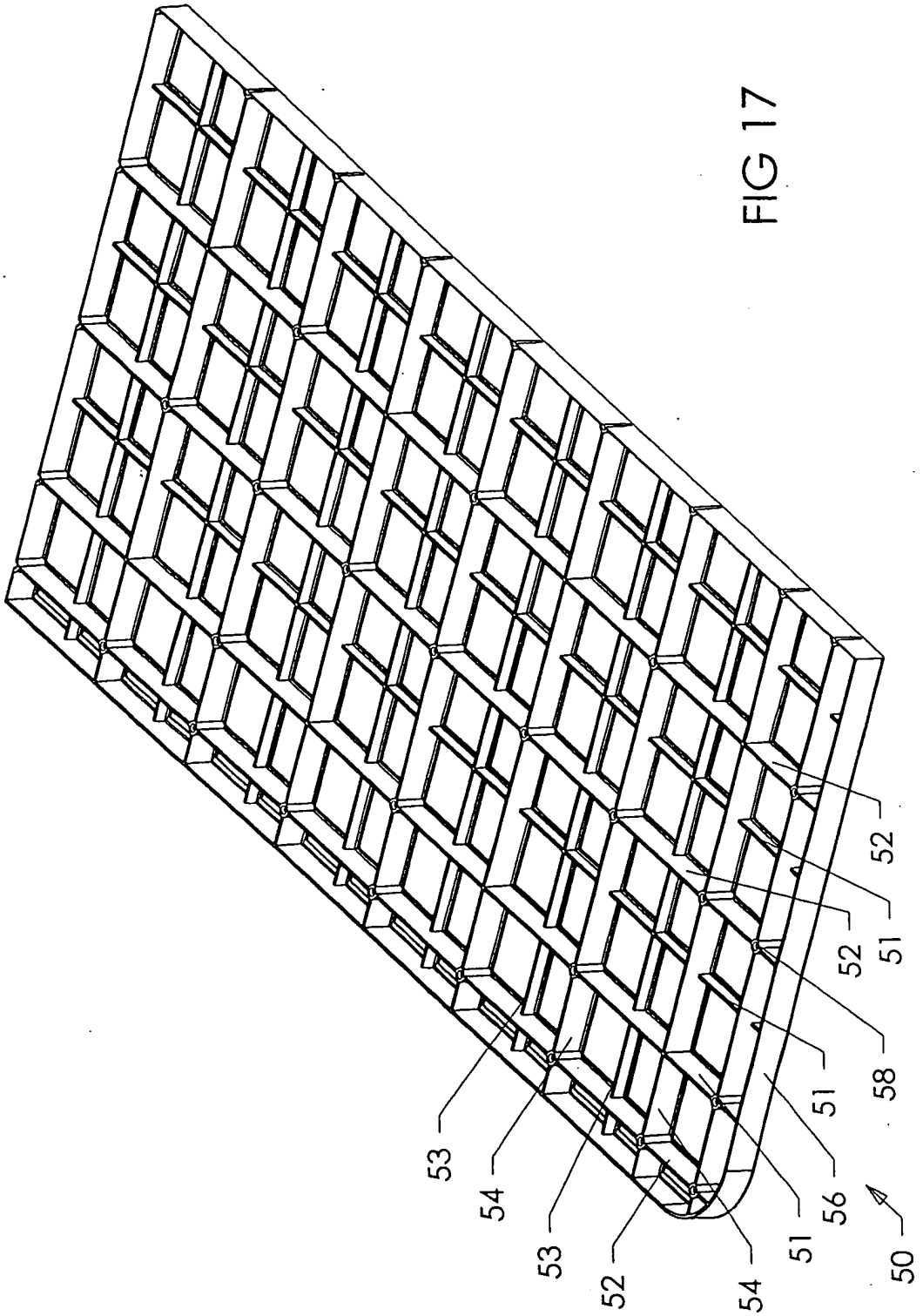


FIG 17

FIG 18

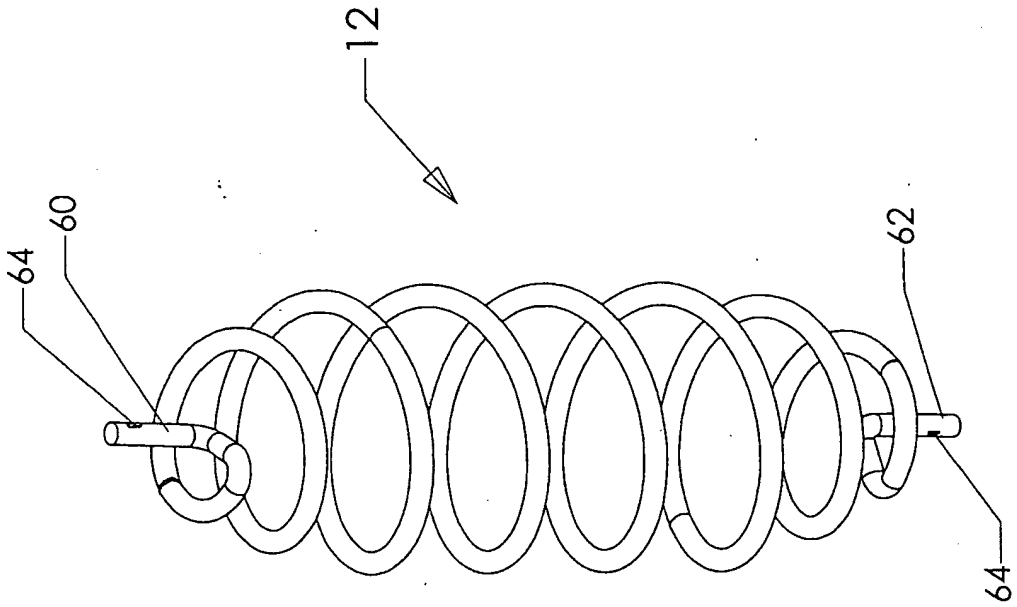


FIG 19

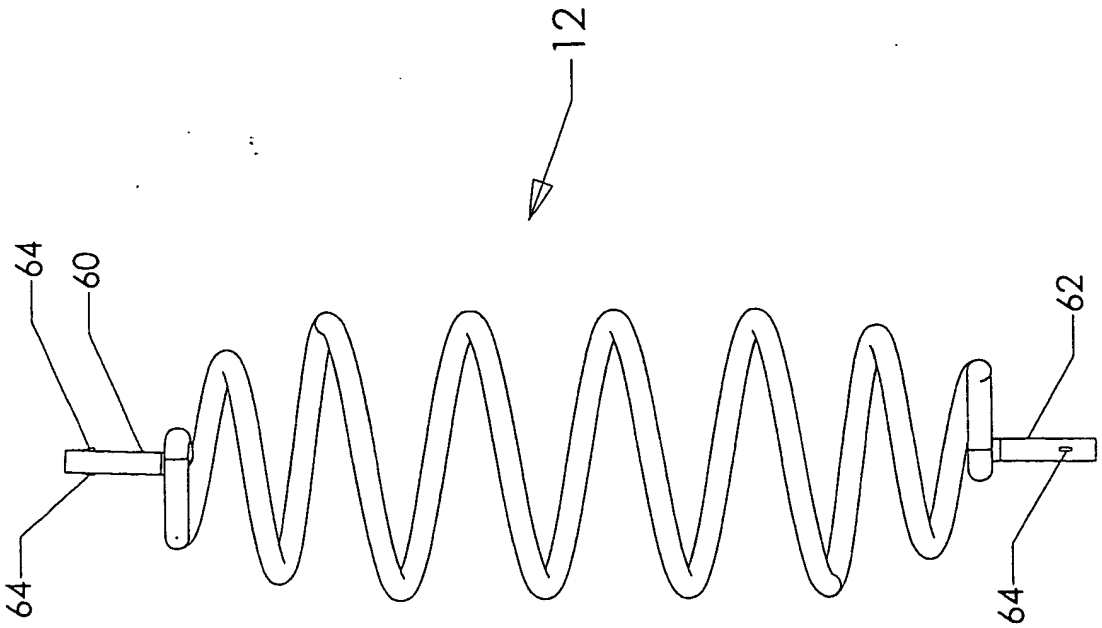
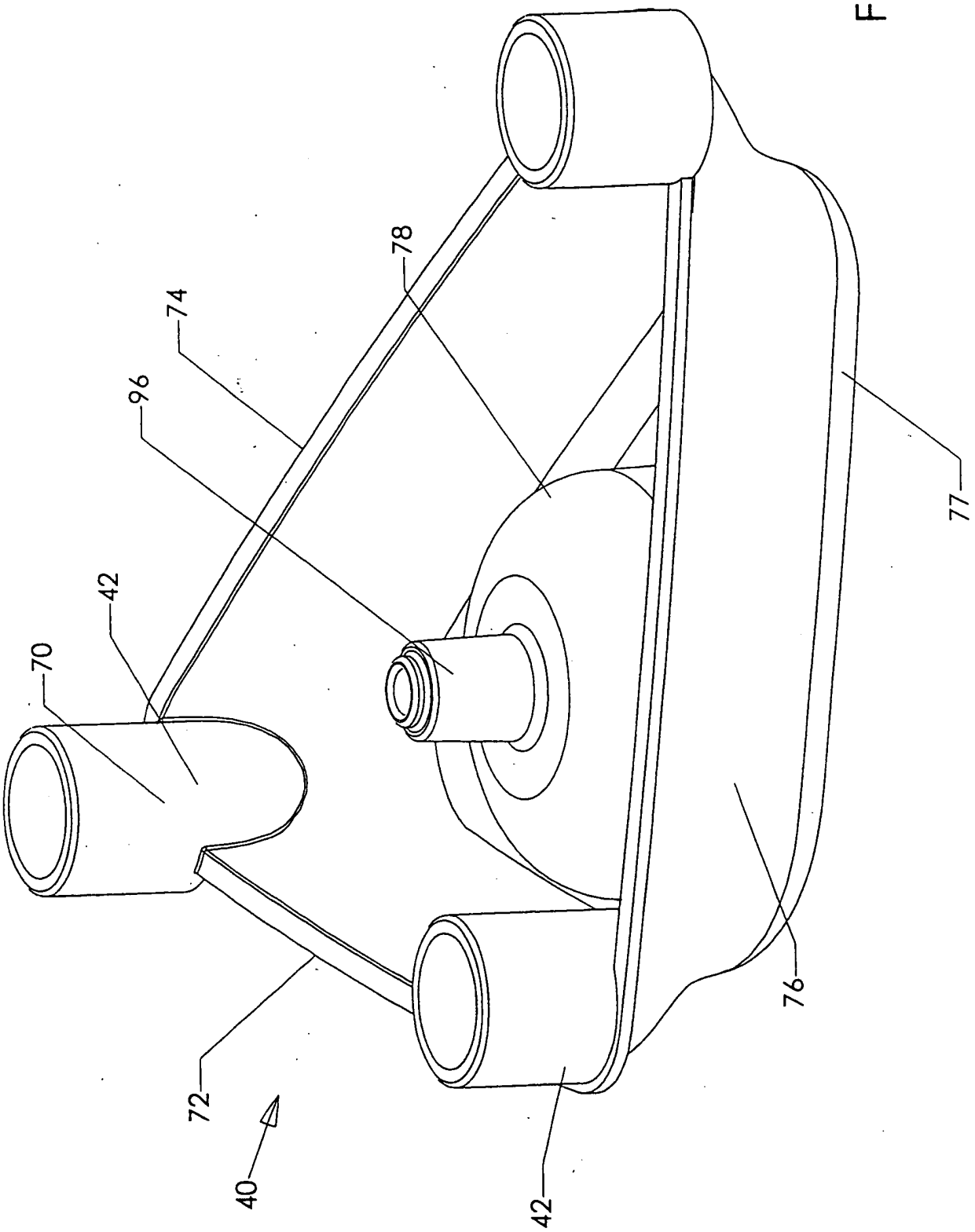


FIG 20



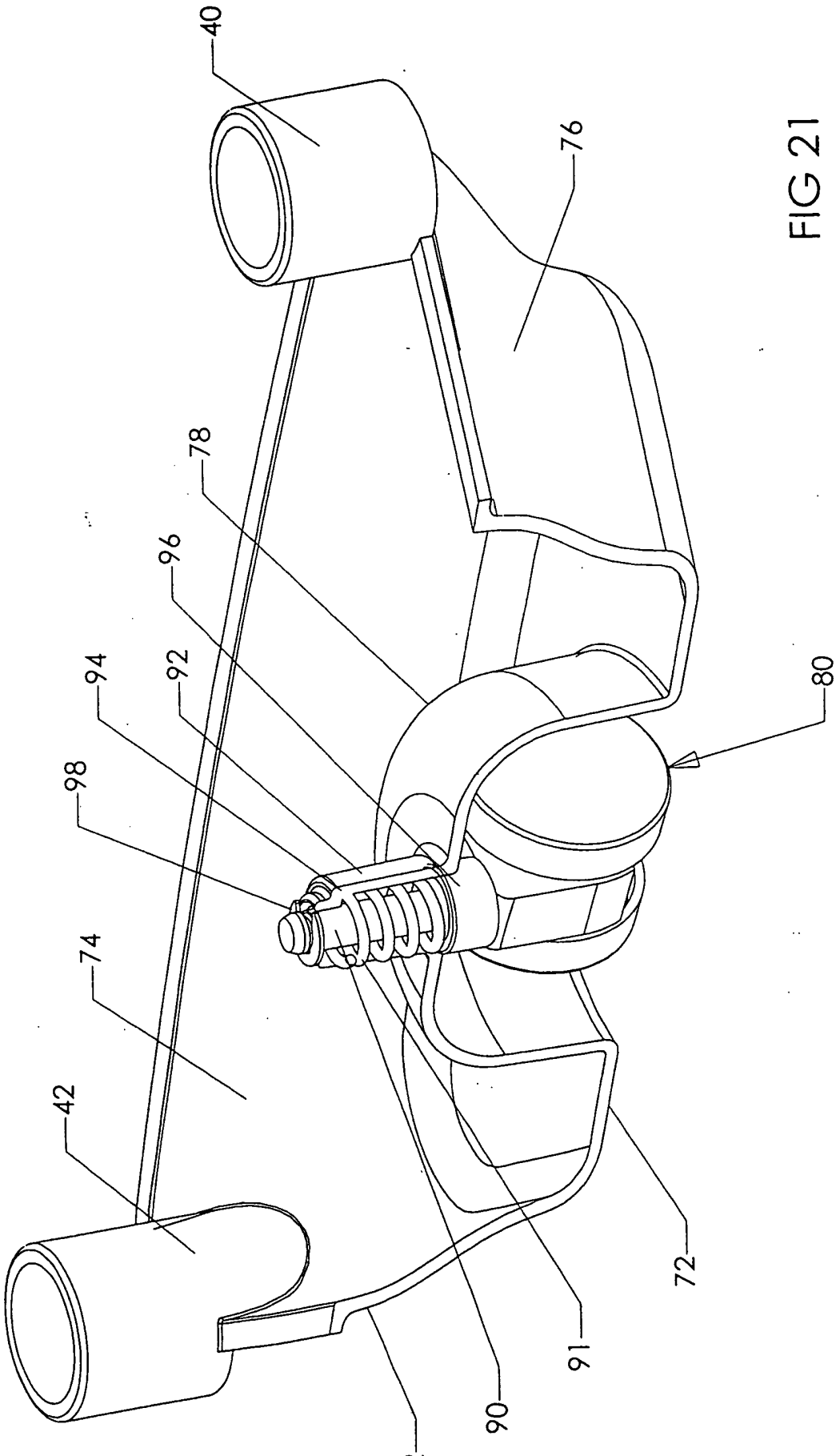


FIG 21

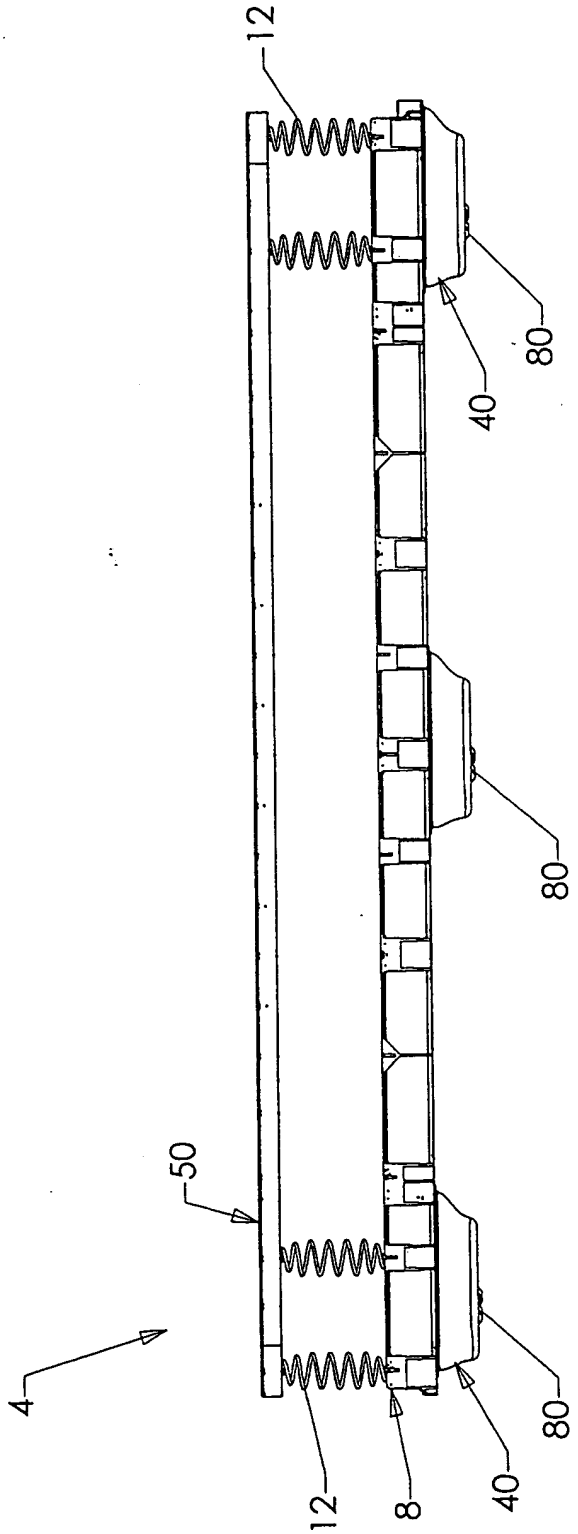


FIG 22

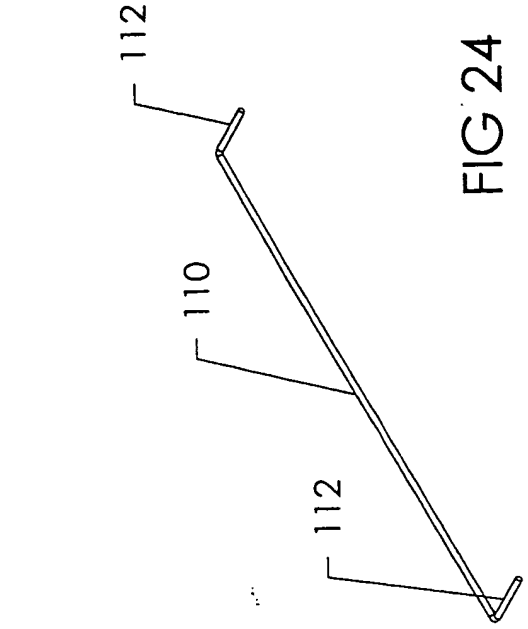


FIG 24

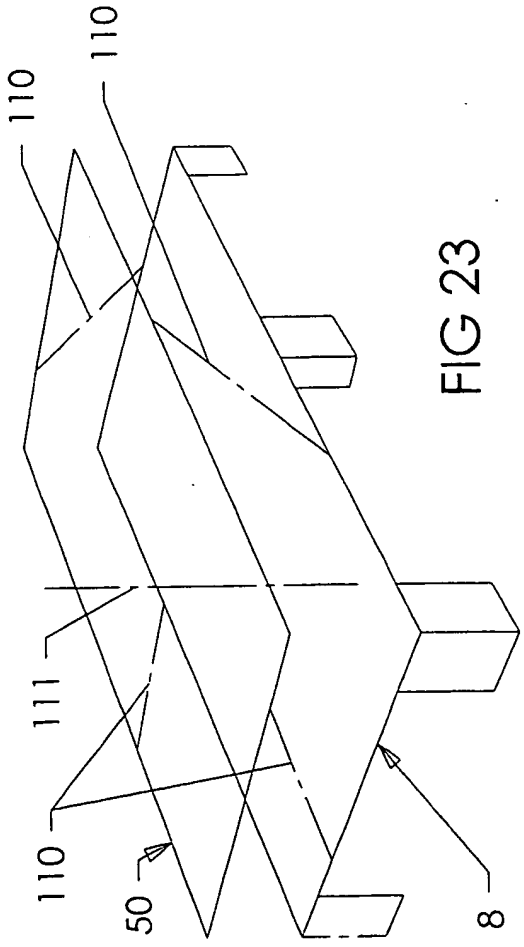


FIG 23

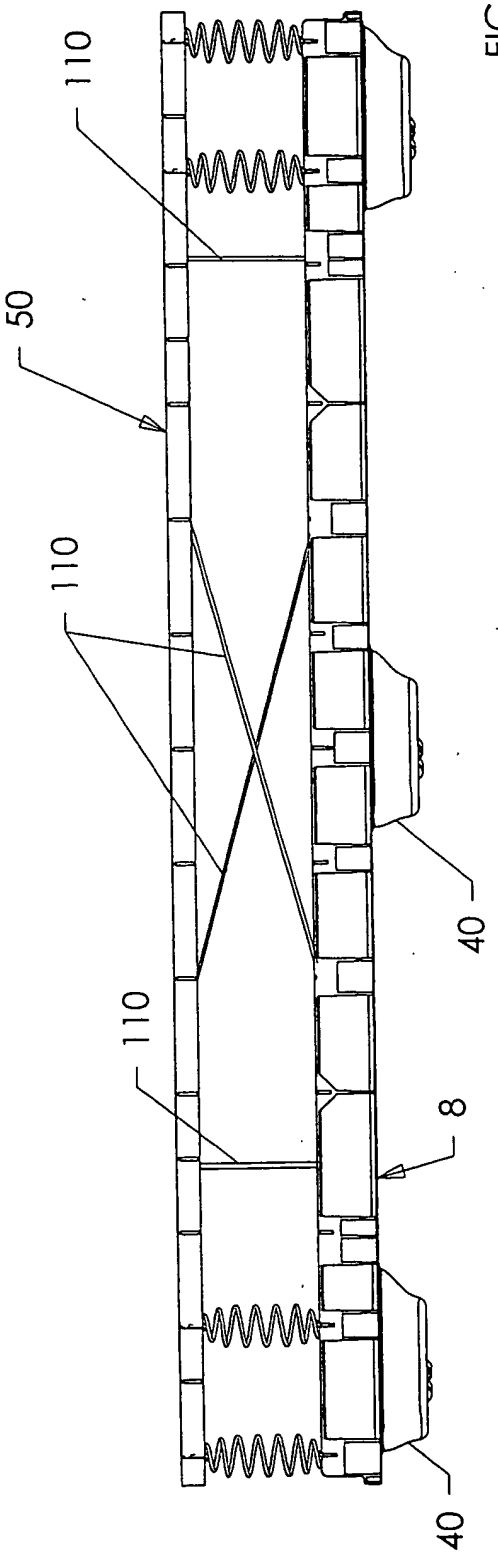


FIG 25

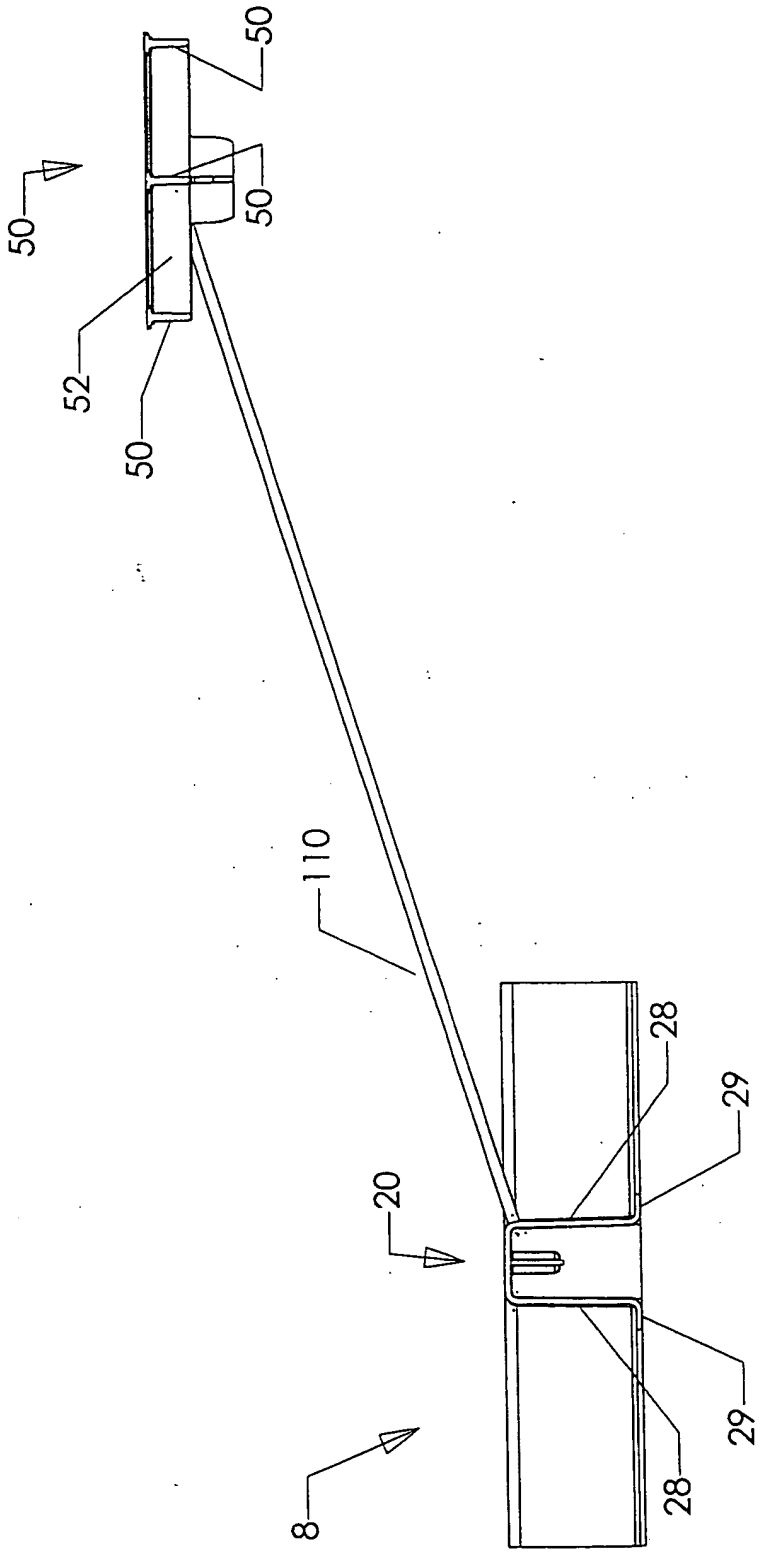


FIG 26

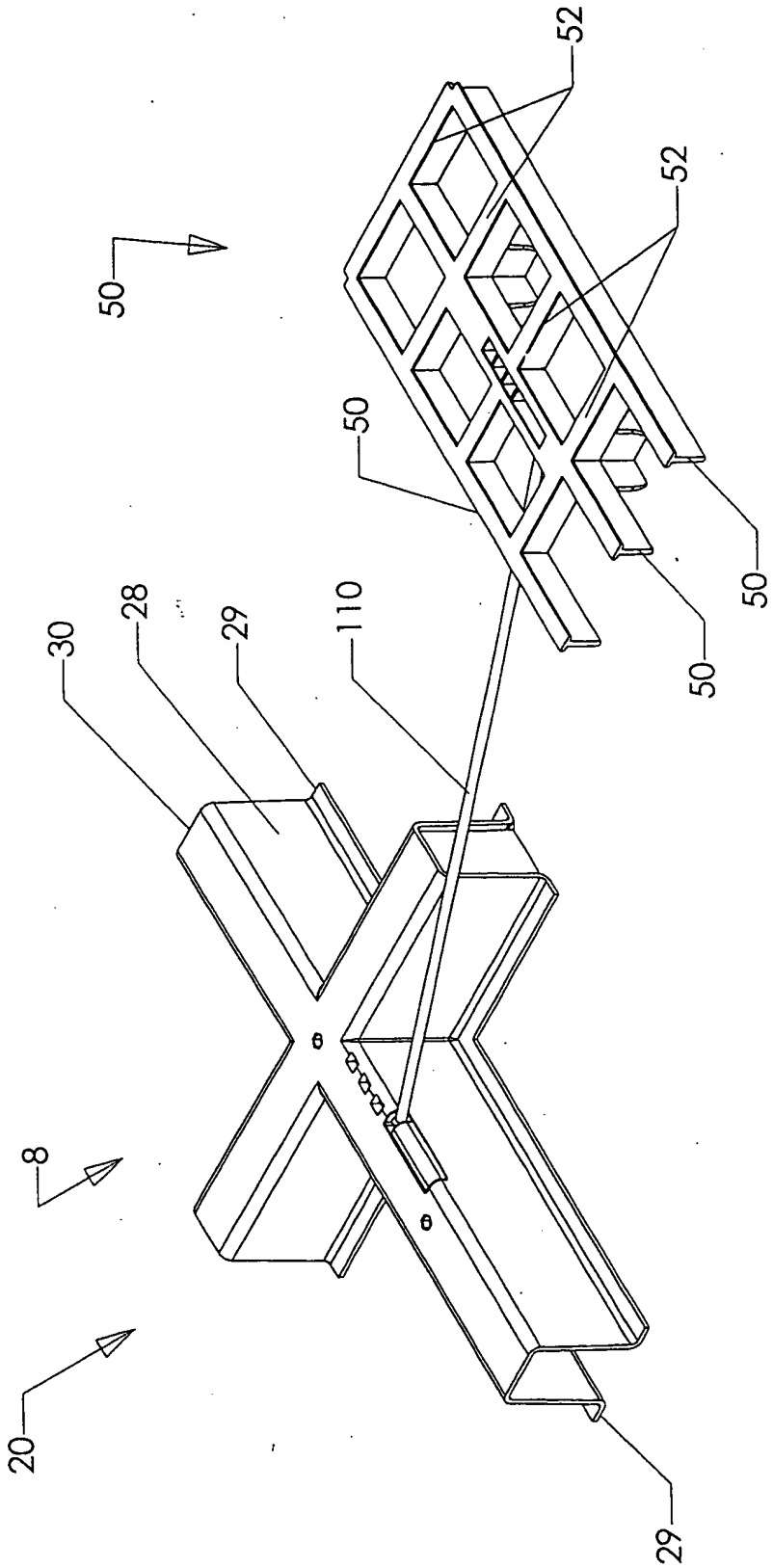


FIG 27

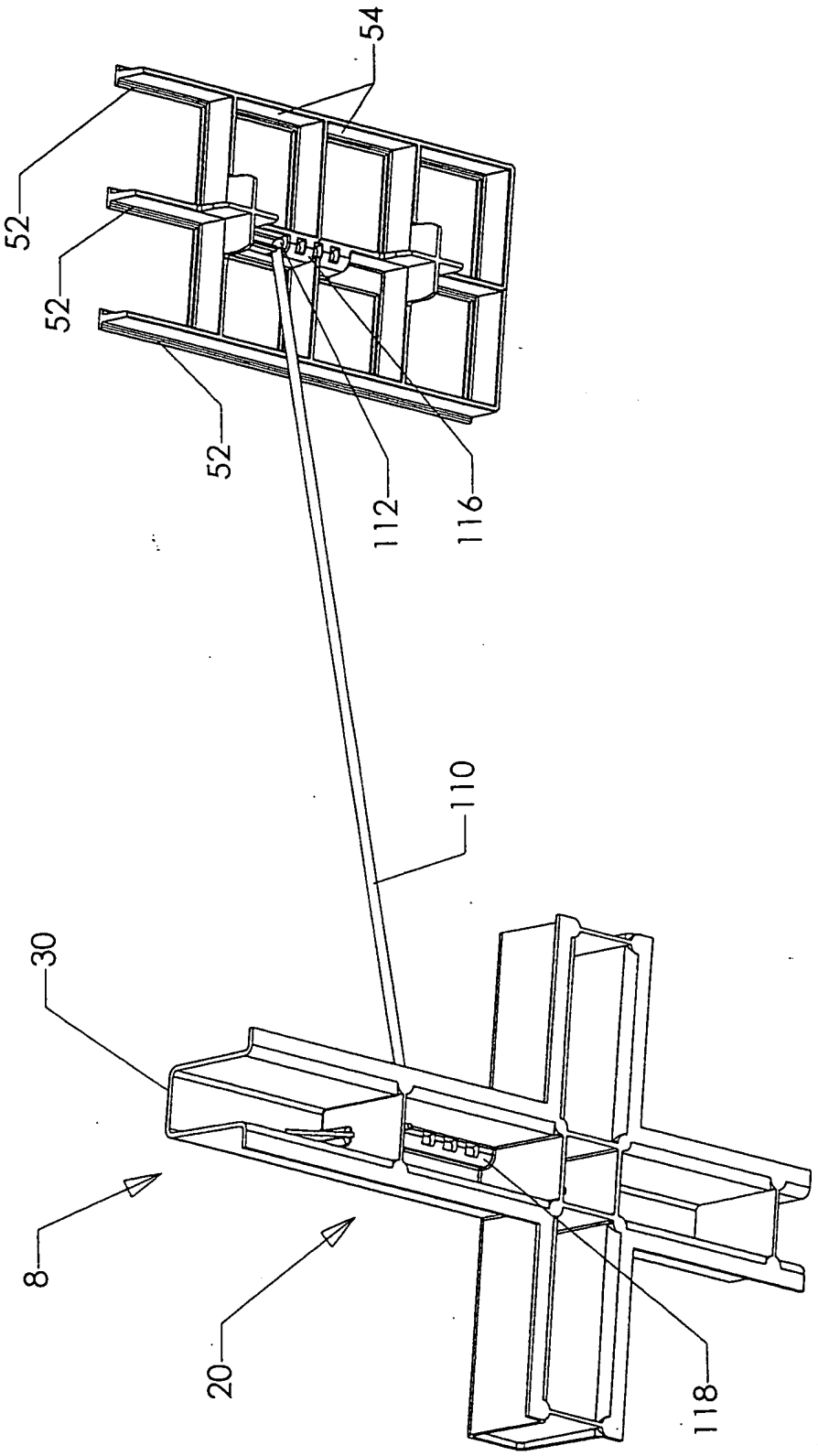


FIG 28

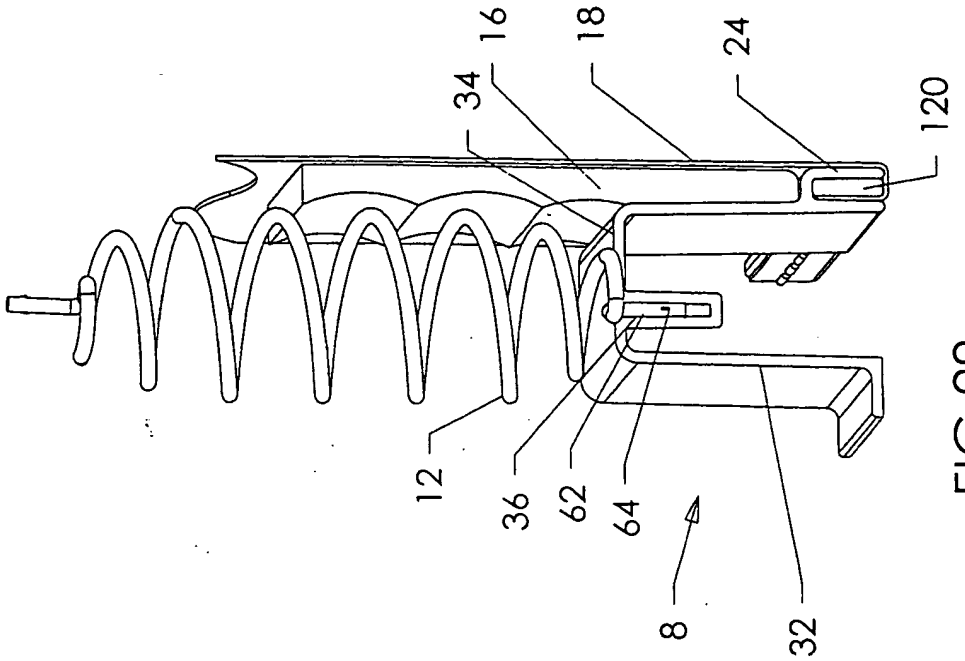


FIG 29

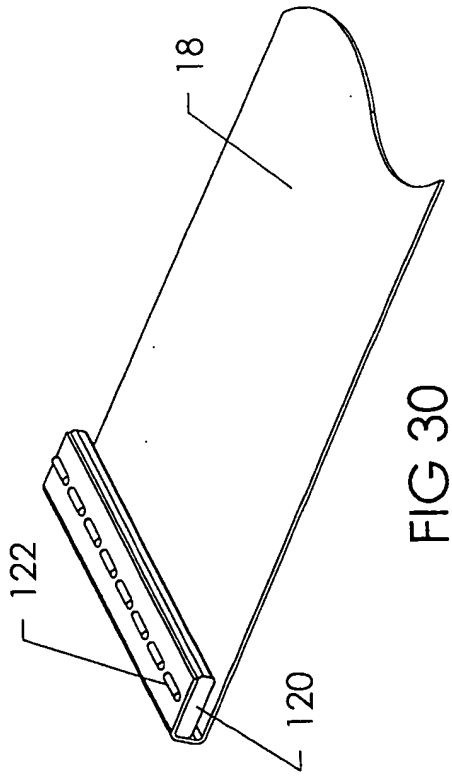


FIG 30

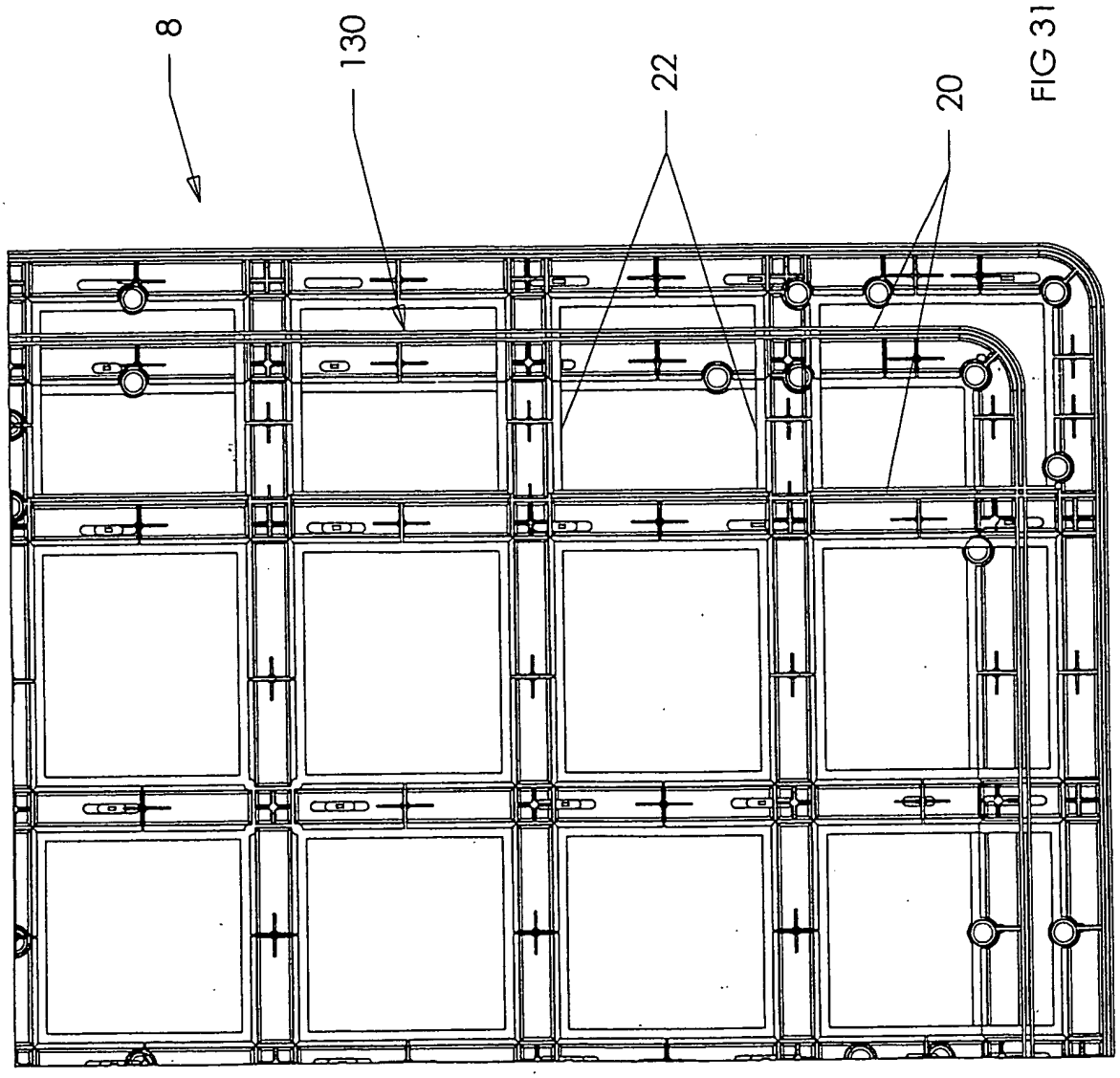


FIG 31

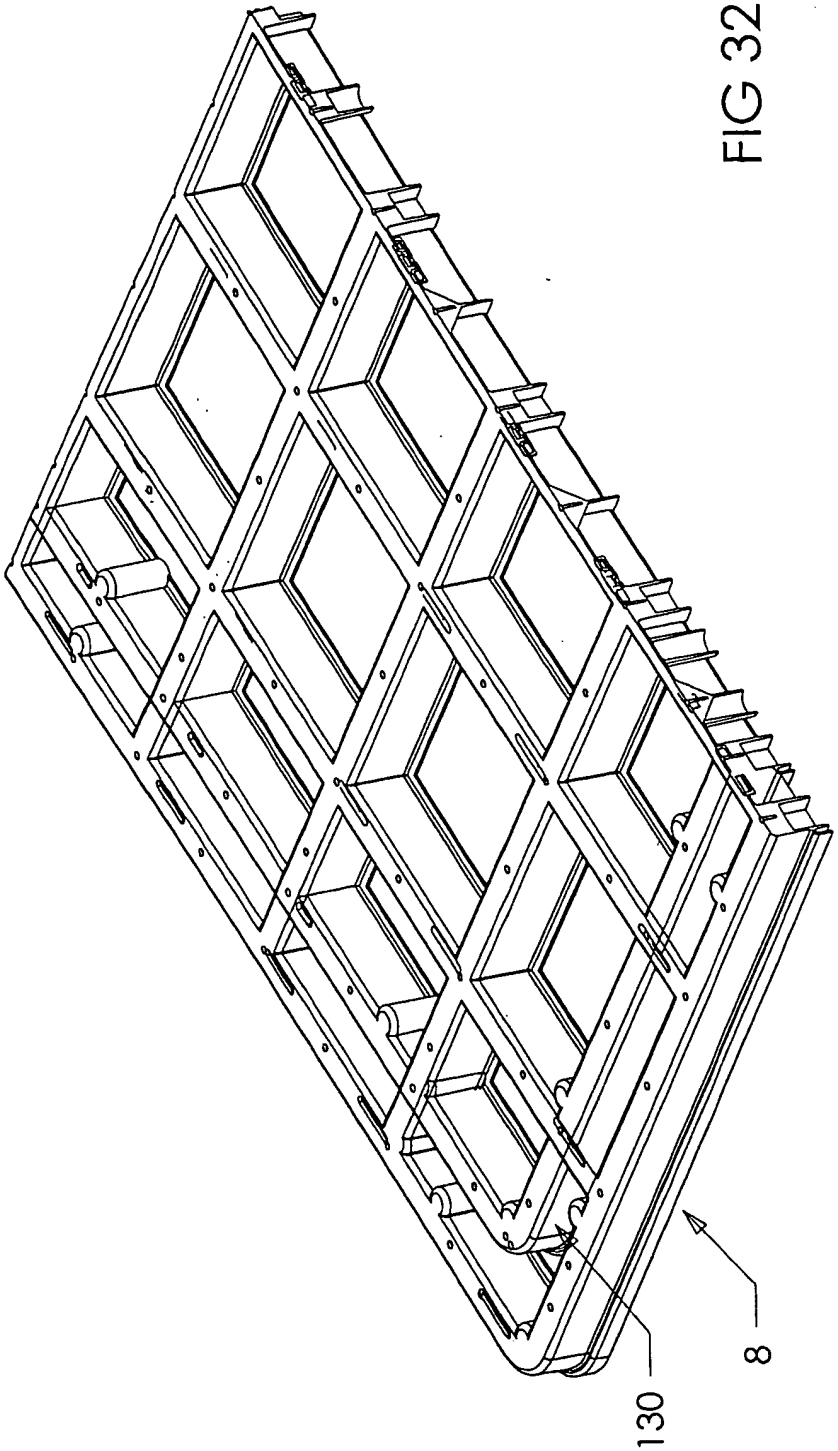
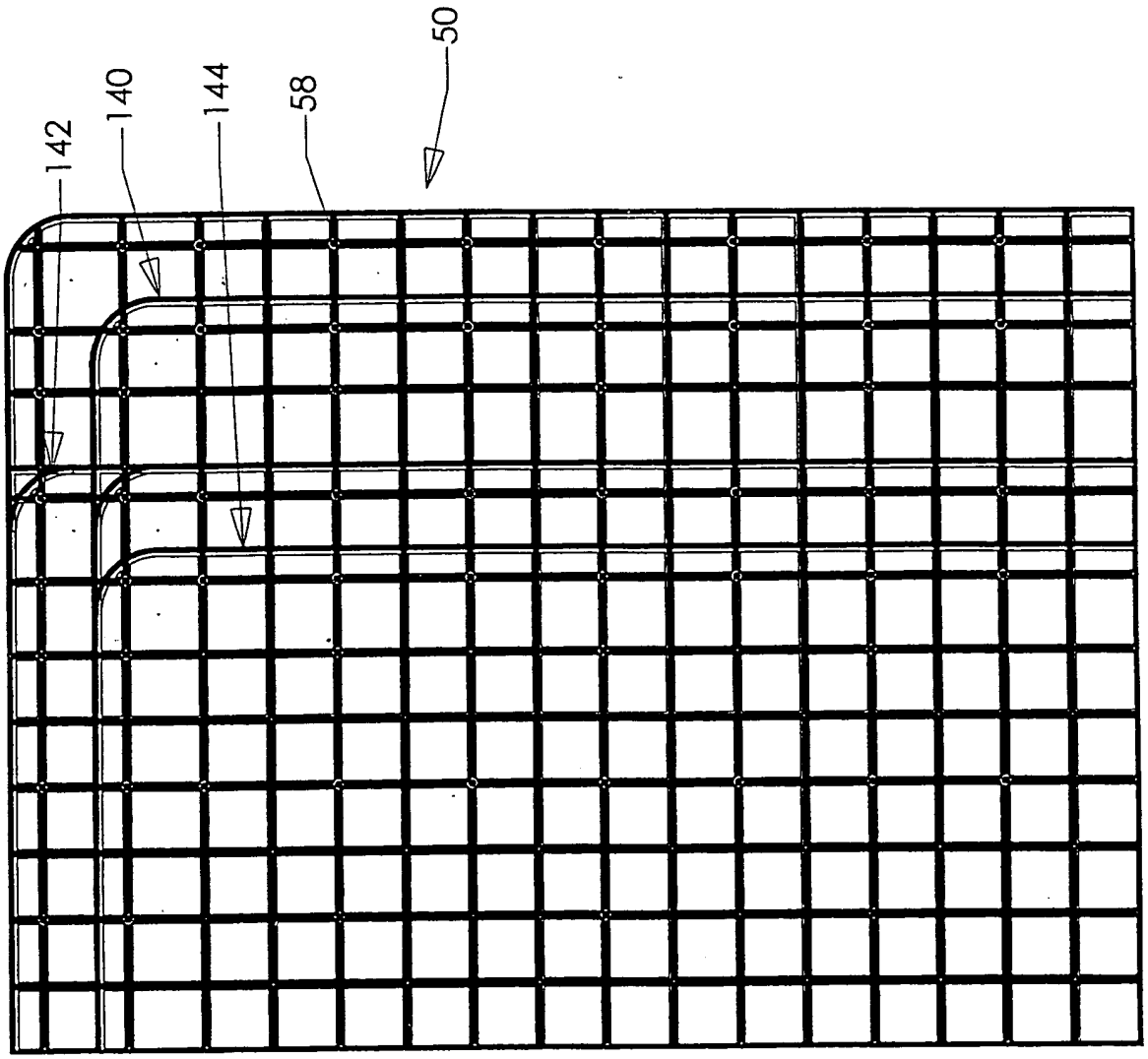


FIG 32

FIG 33



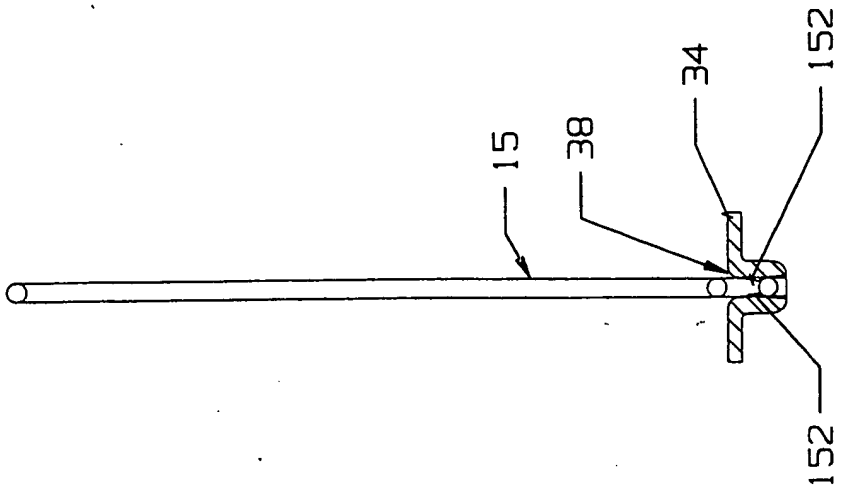

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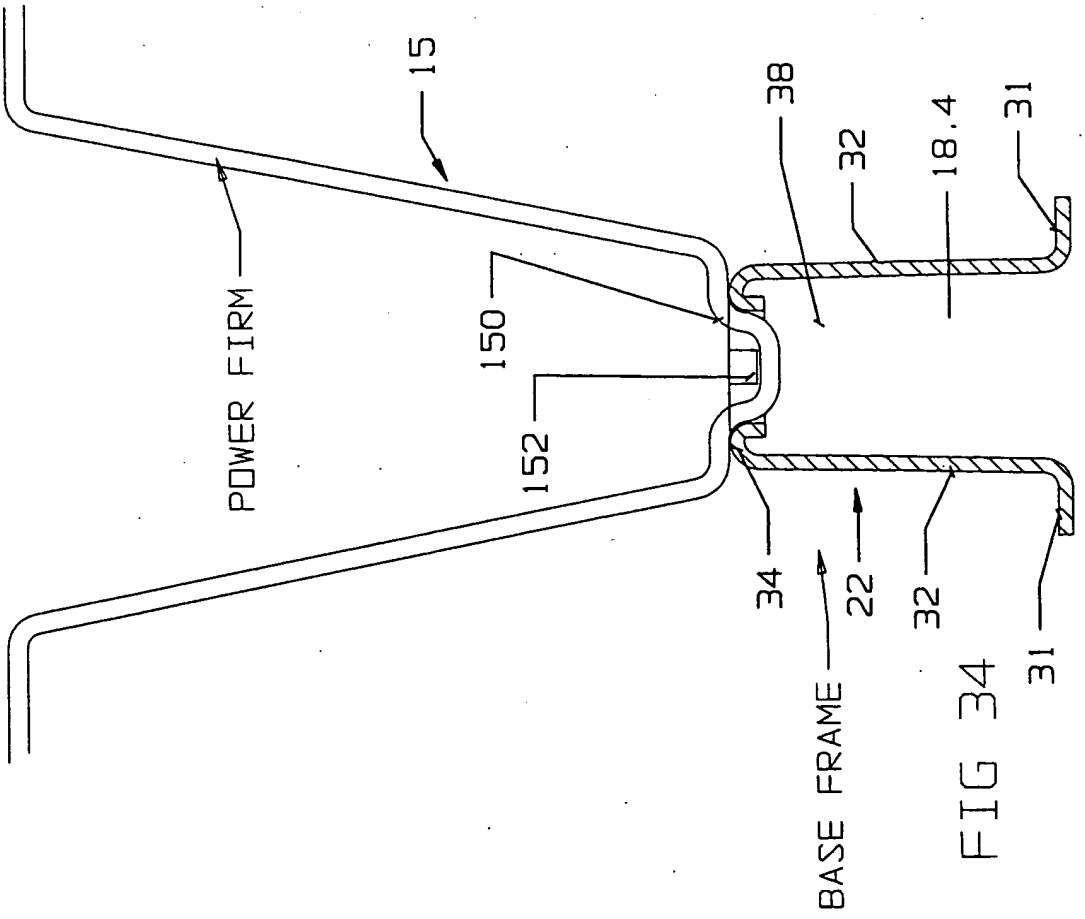
FIG 35


POWER FIRM
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BASE FRAME

FIG 34

INTERNATIONAL SEARCH REPORT

International application No.
PCT/AU 98/00790

A. CLASSIFICATION OF SUBJECT MATTER

Int Cl[6]: A47C 23/043, 23/05

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
A47C 23/-

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
A47C 23/- and (Mo#ld: or plastic: or thermoplastic:)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	FR 2563421 A (MATELAS JYDOR S.A) 31 October 1985 figure 1	1-34
X	GB 2035078 A (WILLIAM McBRIDE MILLS ET AL) 18 June 1980 entire document	1-34
X	US 4319370 A (ROBINSON) 16 March 1982 entire document	1-34

[X] Further documents are listed in the continuation of Box C

[X] See patent family annex

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
17 November 1998	20 NOV 1998
Name and mailing address of the ISA/AU AUSTRALIAN PATENT OFFICE PO BOX 200 WODEN ACT 2606 AUSTRALIA Facsimile No.: (02) 6285 3929	Authorized officer CRAIG GLEGHORN Telephone No.: (02) 6283 2064

INTERNATIONAL SEARCH REPORT

International application No.
PCT/AU 98/00790

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	FR 2460650 A (ANGLY) 6 March 1981 entire document	1-34

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/AU 98/00790

This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document Cited in Search Report		Patent Family Member					
US	4319370	AU	51253/79	BR	7906357	CA	1133203
		DK	4193/79	EP	9905	FI	793066
		JP	55086412	NZ	191758	ZA	7905049

END OF ANNEX